Northeast Maryland Waste Disposal Authority

September 3, 2015

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SEP - 4 2015

Mr. Thomas Ramsey
Project Director
Geosyntec
10220 Old Columbia Road, Suite A
Columbia, Maryland 21046

Dear Mr. Ramsey:

I am writing to you today to issue Work Order No. 101-II-Y under your Contract #13-6(a) with the Northeast Maryland Waste Disposal Authority. The contract is hereby incorporated by reference.

This Work Order is for the work described in your May 27, 2015 proposal as clarified by your letter of July 28, 2015 and your clarification of "a la carte" pricing dated August 28, 2015, regarding the Frederick County Solid Waste Management Options Study (all attached). This Work Order is effective as of September 2, 2015 with an anticipated completion date of March 31, 2017. Frederick County will contact you to provide a "Notice to Proceed" and initiate the meetings identified in the scope.

This Work Order has an upset limit of $153,774 based on the work described in the attached base proposal dated May 27, 2015. Please note that any adjustments to the scope or commencement of a scope item from the "a la carte" pricing must be approved via a written amendment to this Work Order.

Please use Work Order No. 101-II-Y when billing the Authority for this work. As always, each invoice is to be accompanied by a description of the work. I will be your contact person with the Authority on this project relating to contractual and billing matters as well as amendments to the Work Order. Additionally, Geosyntec is expected to be largely working closely with the "Solid Waste Steering Committee"; however, your primary contact for coordination will be with Frederick County's Kevin Demosky. Please call if you have any questions.

Sincerely,

Chris Skaggs
Executive Director

cc: Mr. Kevin Demosky, Director, Frederick County Division of Utilities and Solid Waste Mgmt.
Ms. Cathy Coble, NMWDA
Mr. Jeremy Morris, Geosyntec

Attachment

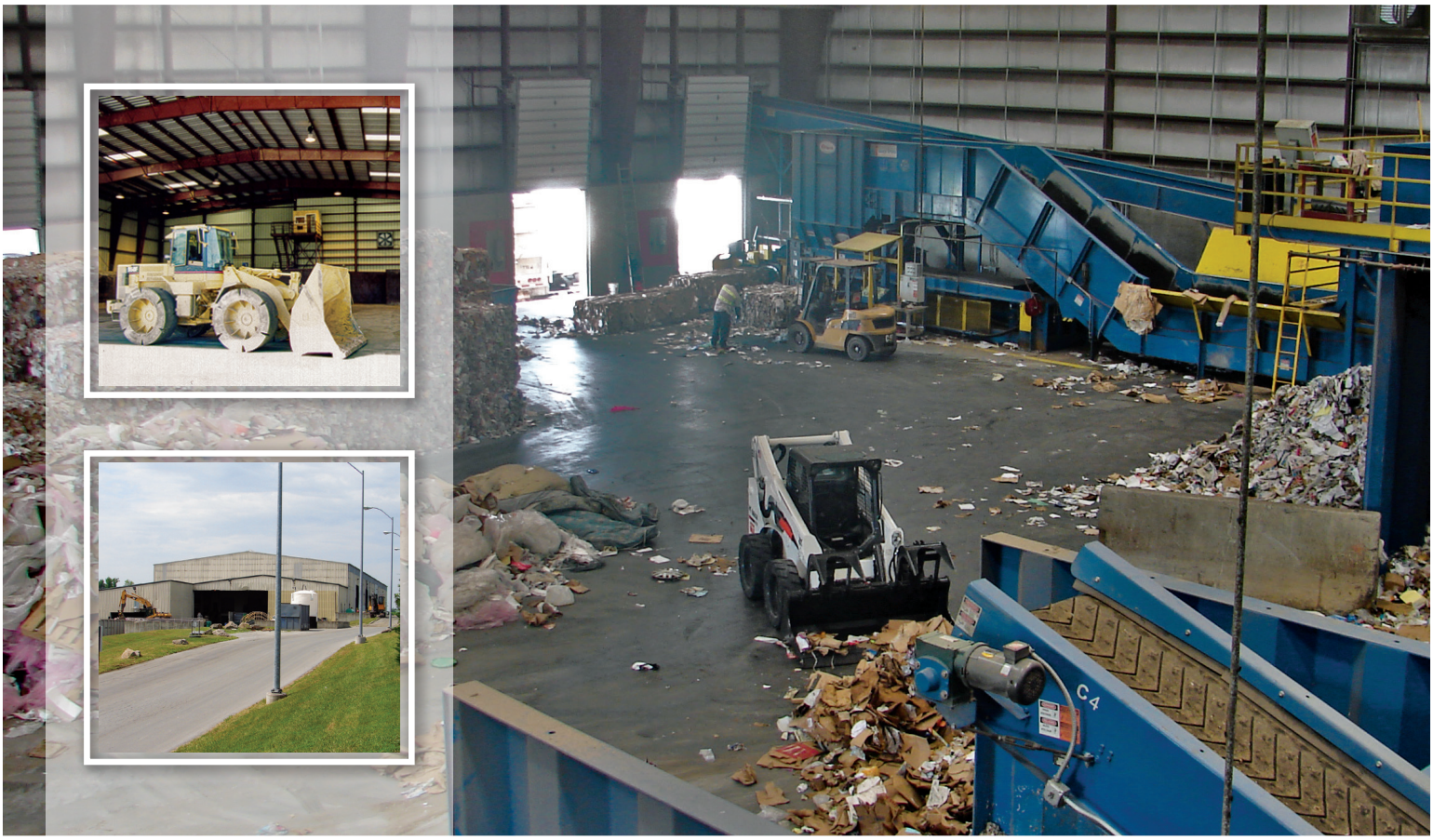
ADM113960SLU.DOC

410.333.2730 / 410.333.2721 fax / authority@nmwda.org
nmwda.org / Business-to-Business Recycling: mdrecycles.org
Tower II - Suite 402, 100 S. Charles Street, Baltimore, MD 21201-2705

PROPOSAL

Frederick County Solid Waste Management Options Study

May 27, 2015



Prepared for:

Northeast Maryland Waste Disposal Authority

Northeast Maryland
Waste Disposal Authority
100 S. Charles Street, Tower II, Suite 402
Baltimore, Maryland 21201

Prepared by:

Geosyntec consultants

In Collaboration with:

NEXIGHT GROUP

a goldsmith resources

Geosyntec consultants

10220 Old Columbia Road, Suite A
Columbia, Maryland 21046
PH 410.381.4333
FAX 410.381.4499
www.geosyntec.com

27 May 2015

Mr. Chris Skaggs, Executive Director
Northeast Maryland Waste Disposal Authority
100 S. Charles Street, Tower II – Suite 402
Baltimore, Maryland 21201

Subject: Proposal for Frederick County Solid Waste Management Options Study

Dear Mr. Skaggs:

Geosyntec Consultants is pleased to provide this proposal to the Northeast Maryland Waste Disposal Authority to deliver a Solid Waste Management Options Study for Frederick County, Maryland. This proposal was prepared by the Geosyntec Study Team in response to the Authority's Request for Proposal (RFP) dated 6 May 2015. The proposed scope of services will be delivered through Geosyntec's existing on-call contract with the Authority.

Geosyntec, the prime consultant, has teamed with two specialty sub-consultants – Nexight Group and A. Goldsmith Resources, LLC – to provide the comprehensive services needed to successfully execute the study. This is a true partnership between experts, with Nexight Group and A. Goldsmith Resources accounting for approximately 34% and 13% of the total proposed budget, respectively. As described in the proposal, the Geosyntec Study Team has recent and relevant experience in similar work as that identified in the RFP. Based in Maryland, we offer deep experience and knowledge of waste management and planning policies and regulation in the state. Our team's expertise with community outreach and coordination, planning for long-term solid waste and recycling management, and technical and financial review of alternative waste management technologies is built upon a legacy of being recognized leaders in helping our clients implement environmental solutions in a safe, efficient, and cost-effective manner.

We would enjoy the opportunity to discuss with you further our qualifications and project experience, and continuing our long-term relationship with the Authority. Should you have any questions, please do not hesitate to contact the undersigned at (410) 381-4333.

Sincerely,

Jeremy W.F. Morris, Ph.D., P.E.
Project Manager

Thomas B. Ramsey, P.E.
Project Director

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APPENDICES

1.0 INTRODUCTION

1.1 Terms of Reference

Geosyntec Consultants (Geosyntec) is pleased to have the opportunity to present this proposal for professional services to deliver a Solid Waste Management Options Study for Frederick County, Maryland. This proposal was prepared in response to the following two documents comprising the Request for Proposal (RFP) issued by the Northeast Maryland Waste Disposal Authority (Authority):

- Scope of Work, Solid Waste Management Options Study, Frederick County, Maryland, dated 6 May 2015; and
- Frederick County Solid Waste Management Options Study – Response to Questions (RTQ), dated 11 May 2015.

The proposed Study Team, with Geosyntec as the prime consultant in partnership with two specialty sub-consultants, is uniquely qualified to deliver the scope of services described herein, which will be provided through Geosyntec's existing on-call contract with the Authority. Our proposal is based on information presented in the RFP and RTQ documents, as well as the Study Team's experience with similar studies, including projects in Maryland.

1.2 Project Background and Objectives

From the RFP documents, the Study Team understands that the County Executive has established a Steering Committee tasked with identifying viable long-term solid waste and recycling management alternatives in Frederick County (County). To support this effort, the County has requested the Authority's support to contract professional services to: (i) engage residents' participation in the decision process through a broad program of interactive workshops; and (ii) perform a state-of-the-practice study of viable, sustainable, and cost-effective improvements or alternatives to the County's current solid waste management and recycling programs. This work will inform the County's development of a long-term waste management strategy.

The County's goals for the study are far-sighted, as illustrated in the multi-phased study approach identified in the RFP. The primary goal of the first phase of the study is to develop a consensus on which viable waste management and recycling alternatives should be specifically studied and evaluated in more detail in the second phase of the study. To conclude this phase, the selected consultant will prepare a draft report summarizing the study results and input received during the workshops for submission to the Steering Committee and County staff. This report will be used to evaluate how the ideas offered during the workshops can be put in place in the County and to identify viable waste management options for further study in the second phase of the study. Options may be considered as stand-alone or integrated technologies to address the County's waste disposal and recycling goals, and may include joint initiatives and cooperation with private and out-of-county entities.

Findings from both phases will be presented as deliverables for this study. In follow-on work, we understand that the County may request in-depth review of contractual and operational arrangements for best implementing the technologies and operational approaches that this study has identified as optimal to the County's long-term waste management strategy.

1.3 Proposed Project Team

Geosyntec has assembled a team of well-qualified and experienced professionals who will provide the comprehensive services outlined in the scope of work as necessary for successful execution of the study. The Study Team, with Geosyntec as the prime consultant with an existing on-call contract with the Authority, features two specialty sub-consultants – Nexight Group, LLC (Nexight) and A. Goldsmith Resources, LLC (Goldsmith). A brief introduction to the Study Team partner firms is provided below. Additional information regarding our team member's roles and qualifications as well as the partner companies' relevant project experience is provided in Section 5.

1.3.1 Geosyntec Consultants

Founded in 1983, Geosyntec (www.geosyntec.com) is a specialized technical advisory and consulting engineering firm that works with private and public sector clients in the built and natural environment. An employee-owned firm with a staff of over 1,100, Geosyntec serves clients from more than 75 offices in the United States, Canada, the United Kingdom, Ireland, Australia, and Malaysia. Most of Geosyntec's staff hold advanced degrees in engineering and related sciences, and have significant experience implementing complex technical, commercial, and financial solutions in the field. Our vision of success builds on our internal culture of technical excellence and the outstanding qualities of our staff and their common commitment to exceptional client service. Our goals are not only to provide cost-effective and innovative solutions, but also to invest in understanding our clients' challenges and opportunities and helping our clients to achieve success by providing value-added consulting services. We are proud of the significant volume of repeat business that we earn from existing clients as being representative of the trust they place in our continued ability to deliver.

Our professionals are uniquely qualified to perform both state-of-the-art and state-of-the-practice projects, and can tackle any unusual problem faced during design and develop pragmatic cost-efficient solutions. The firm's institutional experience covers all stages in the project lifecycle, from initial screening to implementation and commissioning of the project asset, to the lifecycle of operations, maintenance, decommissioning/closure, and post-closure. Of particular interest to this RFP is our knowledge of emerging technologies in waste management. Historically, there have been a large number of start-up technologies and companies in the waste management industry that have touted their services as "revolutionary" or "game-changing," yet ended as failures because they overlooked fundamental economic or technical issues. Geosyntec has helped guide a number of our public sector

clients to objectively and scientifically review available technologies in order to help them successfully select new or emerging technologies for their consideration.

Geosyntec's proposing office on this study is Maryland-based with nationally recognized expertise in the solid waste management industry. Our team, led by Tom Ramsey and Jeremy Morris, has provided solid waste engineering and planning services to dozens of public and private clients across Maryland and the mid-Atlantic region. With over 30 years of service, Geosyntec's solid waste professionals have been involved in more than 1,000 solid and hazardous waste management projects, with lifecycle services to clients including asset acquisition and divestment, pre-development planning and impact assessment, engineering design and permitting, bidding and procurement, construction management and quality assurance, operation and compliance, and renewable energy development and carbon emission reductions.

Geosyntec also provides specialists such as Bill Gaffigan who provide due diligence and financial advisory services (www.geosyntec-cat.com) to public and private clients in infrastructure, energy, utilities, real estate, water, waste containment and other real assets. We have a wealth of experience supporting investments in infrastructure and these core sectors under various project delivery and contracting mechanisms. Our clients are driven to improve performance, secure value for money, achieve required returns and optimize use of assets. To do so, they increasingly seek to understand market drivers, technical, commercial and operational issues. Our transaction advice specialists translate technical and commercial issues into financial analysis, valuations, and support for financial models, with clear recommendations made without bias or allegiance to a particular vendor, service or product. Geosyntec's exceptional advisory capabilities are made possible by our practice leaders' unique understanding of the symbiotic relationship between engineering aspects and the financial performance of geoenvironmental and infrastructure investments.

1.3.2 Nexight Group, LLC

Nexight Group (www.nexightgroup.com) is a technical and management consulting firm that helps government and commercial clients solve complex problems in energy, manufacturing, and infrastructure through technology innovation. **A Maryland-based small business**, the company combines highly experienced workshop planning and facilitation, data collection and analysis, and award-winning technical communications to capture consensus-driven results in a structured and logical framework that prompts action. The company's individuals display a passion of intellectual curiosity and ambition, diverse knowledge and critical thinking skills, approaching client needs with fresh ideas and presenting unique solutions. The company uses collaborative strategies to transform powerful ideas into practical action. With hundreds of workshops and meetings as part of their experience portfolio, the group's facilitators, Ross Brindle and Sarah Lichtner, capture consensus-driven results in a structured and logical framework that prompts action.

1.3.3 A. Goldsmith Resources, LLC

A. Goldsmith Resources, LLC (www.agoldsmithresources.com), **a woman-owned small business**, guides state and local governments, private companies, and trade associations as they pursue sustainable materials management to maximize the recovery of resources from solid waste, and manage what remains in an environmentally protective and fiscally sound manner. Abby Goldsmith, the founding principal, has developed and implemented waste reduction, recycling, and solid waste management programs at facilities across the country for the past 25 years. She is an expert with the knowledge that comes only from first-hand experience, coupled with the ability to communicate the message to any audience. She currently serves as co-chair of the Atlanta Recycles Steering Committee, was the first President of the Georgia Recycling Coalition, and is a founding board member of the New York State Association for Recycling.

2.0 SCOPE OF WORK

2.1 Pro-Bono Review of County Waste and Recycling Infrastructure

As an investment in better understanding the County's needs and constraints for the study, if selected Geosyntec will commit the Study Team Project Manager (Jeremy Morris) and Project Director (Tom Ramsey) to a pro-bono visit to the County prior to full commencement of the study. This visit will provide the Study Team leaders with the opportunity to meet key County personnel that will be involved in the study, as well as to observe and be educated on the existing waste/recycling programs, plans, operations, and infrastructure in the County. Information and insight gained from this visit will be critical in informing the other Study Team members and efficiently and cost-effectively proceeding with the proposed scope in Phase 1. It is assumed that this visit will take one full day for which all labor and expenses incurred will be contributed by Geosyntec.

2.2 Phase 1 – Community Outreach – Brainstorming Sessions

Working closely with the Steering Committee and County staff, the Study Team will leverage their technical expertise in solid waste management and planning to provide facilitation, research, and communications support for the scope of services under Phase 1. The primary goal of this phase of the study is to identify the top-priority waste management and recycling alternatives that should be studied and evaluated in more detail in the second phase of the study. To solicit input from the community, the Study Team will facilitate up to six community workshops and prepare a summary report after each workshop. These workshops will be conducted countywide by Nexight at locations selected by the Steering Committee. Over the course of leading hundreds of workshops, Nexight has honed their process of engaging diverse stakeholders to quickly gather information and both layman and expert viewpoints using a time-efficient, accelerated schedule to target priorities and pathways that can drive transformative change.

As described below, the proposed scope of services for Phase 1 is divided into nine tasks (Task 1.1 through 1.9). Initially, the Study Team will collect information pertaining to existing solid waste and recycling facilities and practices in the County (Task 1.1). This information will be used to develop educational materials (Task 1.2) and plan for the community workshops (Task 1.3). Following completion of the first five community workshops (Task 1.4), the Study Team will summarize the outputs of the workshops (Task 1.5). In parallel with these activities, the Study Team will conduct supplemental research and analysis on national and international solid waste and recycling practices and perform a state-of-the-practice review of alternative waste technologies (Task 1.6). Thereafter, all input from the first six tasks will be synthesized into a Draft Phase 1 Expanded Summary Report (Task 1.7). The Draft Phase 1 Report will be reviewed and refined through a series of additional workshops and meetings, including a sixth workshop to gather feedback from County residents, a meeting with the Steering Committee and a final presentation to the County Executive and County Council (Task 1.8), before a Final Phase 1 Report is prepared (Task 1.9). It is assumed that the County will provide

feedback, comments, and relevant documents in a timely manner to support Geosyntec in completion of the work.

As described in subsequent subsections and shown in the proposed study schedule (Section 3), up to five meetings with the Steering Committee and other County personnel are proposed under Phase 1. Currently, it is assumed that these will be in-person meetings held at County facilities; however, the Study Team will seek the opportunity to hold one or more of these meetings online if that is compatible with the County's needs. Should additional meetings be required, additional budget may be required. At a minimum, the Study Team Project Manager and Lead Workshop Facilitator will attend all Phase 1 meetings. At a minimum, the Study Team Project Director will attend the study kickoff meeting (Task 1.1) and the presentation to the County Executive (Task 1.8). Other Study Team members may attend one or more meetings as appropriate based on the meeting agenda.

In scoping proposed tasks in Phase 1, Geosyntec has assumed that the level of effort required to address comments will be reasonable. Should the County's comments be excessive in nature, redundant with previous draft submittals, or require Geosyntec to address issues outside the scope of the original application, Geosyntec will prepare a request for additional budget.

2.2.1 Task 1.1 – Collect County Information

The Study Team, headed by Nexight in this capacity, will work with the Steering Committee to gather information about the County's current solid waste and recycling practices, including information about current collection processes, recycling and disposal practices, approximate costs to the citizens and businesses for the current system, and the make-up of County waste and recycling streams. This information, supplemented with additional research about alternative solid waste management practices and successful programs in other counties, will provide a baseline for the study as a whole and will help to educate workshop participants. The information-gathering process will involve up to two onsite meetings with the Steering Committee, including a study kickoff meeting at the initiation of the study.

As directed by the Steering Committee, it is anticipated that the Study Team will obtain the information identified above via two primary methods: (i) review of pertinent documents related to County waste and recycling operations and polices; and (ii) conducting telephone interviews with County staff. Examples of pertinent documents that may be requested by the Study Team include:

- Annual solid waste management reports
- Budget and enterprise funding assessments
- Facility operations plans and permits
- Maps illustrating waste collection/handling systems and waste transportation corridors
- Development plans at and adjacent to existing County facilities
- Existing agreements related to waste collection, handling, processing, and recycling
- Zoning or other land use documents

Personnel from all three partner firms will participate in Task 1.1, which is intended for the Study Team to gain a holistic understanding of current waste management and recycling activities (both traditional and advanced technologies) that are taking place in the County. Information obtained will be evaluated in terms of: (i) solid waste and recycling facilities and activities within the County wasteshed; (ii) current waste stream composition and volumes; (iii) potential changes in waste stream composition and volumes anticipated due to new legislation and regulation and (iv) the solid waste business environment in and around the County wasteshed that will potentially affect the implementation of alternative technologies. The Study Team is skilled at conducting qualitative and quantitative research, documenting sources, cross-checking, verifying, and interpreting information and data. By applying rigorous data collection and analysis techniques, we can rapidly distill and synthesize the County information for use in the remainder of the project tasks.

2.2.2 Task 1.2 – Prepare Educational Materials for Workshops

It is expected that community workshops will be attended by local residents and elected officials, representatives from the County's solid waste management and recycling programs, local business interests (including collection contractors and other private waste/recycling service providers), and other stakeholders. Because attendees may have varying degrees of knowledge and understanding of local and regional waste management practices, it will be essential to provide the workshop participants with educational materials to help inform their contributions.

Using the information gathered and synthesized in Task 1.1, the Study Team, led by Nexight in this capacity, will develop factsheet summaries regarding current waste management practices in the County and region. Factsheets will be distributed to workshop participants through a workshop background document (see Task 1.3) and will be provided as handouts during each workshop. These handouts can also serve as takeaway reference materials for each workshop participant. Additionally, a PowerPoint presentation will be prepared to provide a brief (30 to 45 minutes) background overview of the study goals at the beginning of each workshop. The Study Team will consult with the Steering Committee to craft these materials to contain the right tone, look, and level of technical detail necessary for the target audience.

2.2.3 Task 1.3 – Plan Workshops

The Study Team's workshop planning activities in Task 1.3 will be provided by Nexight. During the planning phase, team members will work closely with the Steering Committee to identify specific participants to invite to each workshop, including the list of expected attendees identified above. The Study Team will support the Steering Committee's efforts to publicize the workshops to attract participation from County residents and stakeholders. This combination of targeted and open invitations will help ensure sufficient workshop attendance and a more balanced mix of participants and perspectives at each workshop.

At least two weeks prior to each workshop, Nexight will develop a brief (~10 pages) workshop background document that will be made available to potential workshop participants. The workshop background document will include essential pre-reading material, including background information

about the County's current solid waste management practices, a brief summary of successful waste management and recycling programs in other jurisdictions, the workshop purpose and scope, guidelines for participation, and a detailed workshop agenda. The stated aim of the workshop background document is to provide a single reference resource for participants with everything they need to arrive prepared and ready to contribute to workshop discussions. The workshop agendas and the contents of the workshop background documents will be informed by up to two onsite meetings with the Steering Committee. During the workshop planning phase, Nexight will coordinate directly with County staff regarding any facility requirements (e.g., AV equipment).

2.2.4 Task 1.4 – Facilitate Workshops

Nexight will provide workshop facilitation services on behalf of the Study Team, using highly visual, structured techniques to brainstorm, analyze, and prioritize information to create actionable plans that the County can pursue. These techniques will be used to help identify viable, sustainable, and cost-effective improvements or alternatives to the County's current solid waste management and recycling programs. The facilitation methods will take care to engage different viewpoints through significant debate, allowing identification of areas of consensus without driving participants to "groupthink" results. Throughout the workshop, brainstorming methods will be used to encourage creative thinking, followed by careful analysis of the results to add logic, structure, and rigor to outputs. In addition, a variety of prioritization methods, from simple voting to more complex pair-wise comparisons and other techniques, will be used.

Nexight will provide a Lead Workshop Facilitator, Assistant Workshop Facilitator, and one additional staff person for note-taking for each workshop. This staffing combination will maximize workshop contributions from participants and will ensure that all contributions are captured for inclusion in workshop summary reports. The accurate and thorough capture of workshop findings is essential for enriching the contents of the Phase 1 Expanded Summary Report. Five workshops will be provided under Task 1.4. At a minimum, the Study Team Project Manager and Project Director will attend the first workshop. Their further attendance at subsequent workshops will be at the advice of the Lead Workshop Facilitator and Steering Committee.

2.2.5 Task 1.5 – Summarize Workshop Findings

Within 10 business days of each workshop, Nexight will prepare a summary report for submission to the Steering Committee and County staff. The workshop report will include an outline of the workshop plan, a summary of the input received from participants during the workshop, a list of workshop attendees, and a summary of recommendations based on the consensus of workshop attendees.

Nexight's award-winning technical communications team specializes in synthesizing vast amounts of technical content to convey key messages clearly and accurately. To help aid in the scannability of results, Nexight's communications team will use tables, figures, and other graphical formatting to the extent possible. The workshop findings will also be edited and synthesized so they are easier to digest, which will be particularly important for any stakeholders or Steering Committee members that are unable to attend the workshop.

2.2.6 Task 1.6 – Evaluate Alternative Waste Technologies

Concurrent with Tasks 1.2 through 1.5, the Study Team will perform a state-of-the-practice review and comparative analysis of "non-traditional" technologies employed by the waste management and recycling industry, as well as policies, financial stimuli, and other initiatives used to successfully promote such technologies. The team will focus on commercially viable technologies and also identify regulatory and financial hurdles that could impact different options. The scope of services under Task 1.6 will be delivered primarily by Geosyntec with significant support from our expert sub-consultant Ms. Abby Goldsmith.

The Study Team will analyze industry trends that move away from traditional waste disposal practices (e.g., landfilling, incineration) to more sustainable waste diversion and conversion practices. Our approach to evaluating industry trends not only evaluates "hard infrastructure" (e.g., feedstock pre-processing technology, operations, control equipment, emissions, scalability constraints), but also examines the supporting "soft infrastructure." Soft infrastructure analysis for waste conversion technologies may involve, for example: (i) social and cultural impacts on technology selection; (ii) health and safety considerations; (iii) national, state, and local legal, regulatory, and policy requirements; (iv) financial (business model) incentives and requirements; and (v) marketplace conditions and their impact on the economics of the technology. Our holistic and flexible approach allows for rapid evaluation of technical, economic, and social feasibility, and is based on a combination of technical/legal analytical methods and protocols used in technology transfer of best management practices. Examples of such methods and protocols include those used by entities such as the United Nations Environment Program (UNEP) and the United States Environmental Protection Agency's (U.S. EPA's) Technology Transfer Subcommittee (part of the National Advisory Council on Environmental Technology and Policy).

Specifically, the state-of-the-practice review of viable waste processing and recycling alternatives for various parts of the waste stream ("hard infrastructure") will encompass:

- Best practices from international, national, and regional efforts
- Single stream recycling and resource recovery facilities
- Separation technologies (e.g., recycling, organics/food waste diversion) for processing of mixed waste
- Conversion technologies that produce marketable products (e.g., compost, fertilizer, ethanol, etc.) and/or renewable energy (e.g., renewable natural gas, compressed natural gas, electricity, heat) from waste
- Waste and energy trends that may facilitate or hinder adoption of these processes
- Costs and revenues association with implementation of these technologies

Non-traditional conversion technologies which could be considered include: (i) composting; (ii) fermentation; (iii) anaerobic digestion; (iv) pyrolysis; (v) gasification and plasma arc technologies; (vi) fertilizer and biodiesel production; and (vii) refuse-derived fuel (RDF) and thermal conversion. Some of these technologies (e.g., anaerobic digestion, composting, and thermal conversion) are more effective when incorporated within an integrated materials recovery facility (MRF) concept that involves

significant pre-processing (feedstock separation). Our team will also examine optimal combinations of technologies (hybrids) that would be appropriate for various waste streams and/or wastesheds. For example, next-generation waste-to-fuels (ethanol) technology is a combination of waste gasification and fermentation.

The Study Team will first consider a broad list of potential conversion technologies based on agreed evaluation criteria. Technologies will be qualitatively ranked in a matrix to facilitate rapid comparison between several different alternatives. The evaluation criteria to be used will be finalized during discussions with the Steering Committee once the study is underway; however, based on the Study Team members' previous experience, the following four primary criteria have proved successful:

- Fiscal, including:
  - Impact on rates (e.g., capital expenditure, O&M costs, system costs and revenues)
  - Economic risks (e.g., sustainability of funding, opportunities for regional risk sharing)
  - Market risks and cost/revenue certainty
- Environmental, including:
  - Impact on waste prevention, recycling, and landfill diversion
  - Impact on resource consumption (e.g., land, water, energy, materials, fuel)
  - Protection of land, ambient air, groundwater, and surface water resources
  - Sustainability
  - Climate change
- Operational, including:
  - Complexity of implementing and extent of program changes required
  - Complexity of system and facility operation
  - Residue disposal
  - Labor requirements
  - Operational risks (e.g., expected downtime, feedstock contamination, energy supply/demand, service life, emergency response)
  - Flexibility, adaptability to system/feedstock changes, and scalability
- Planning and Policy, including:
  - Compatibility with Equity and Social Justice (ESJ) ordinances (e.g., equity of fees, facility siting)
  - Policy implications
  - Level of service to County citizens
  - Compatibility with existing and future land uses and development within the County
  - Acceptability to County citizens and effects on livability and character of communities
  - Job creation
  - Educational requirements

It is assumed that the matrix will highlight no more than six technologies or combination of technologies that offer sufficient technical and financial merit to be shortlisted for further study and consideration in Phase 2. In scoping subsequent tasks, Geosyntec has assumed that the County will not make revisions

to the shortlisted technologies once this evaluation is completed. Should the County request changes or additions to the selected technologies, additional budget may be required.

As specified in the RFP, consideration of "soft infrastructure" will encompass review of Maryland's waste management and recycling statutes, including the Zero Waste requirements, in comparison to the requirements of other states and jurisdictions. The potential impact of these regulations on the County and the probable cost to implement programs to conform to these regulations will be estimated. The Study Team will also develop a compendium of information about alternative strategies and programs, including a summary of funding sources and comparison of actual costs with other conventional options. The review will also examine recycling rate calculation methods between Maryland counties and other states and jurisdictions, and provide a direct comparison between the County's current waste generation and recycling rate and that of other Maryland and U.S counties of similar size and characteristics, calibrating major differences found between calculation methodologies and revenue requirements. Finally, the Study Team will discuss the projected cost burden and revenue potential associated with implementing various disposal and recycling options, and review legislative options (e.g., "pay as you throw" programs or mandatory recycling) for improving the efficiency or fairness of providing waste management services to County residents.

2.2.7 Task 1.7 – Draft Phase 1 Expanded Summary Report

The primary purpose of Task 1.7 is to integrate and summarize findings from Tasks 1.1 (County information), 1.5 (workshop summaries), and 1.6 (state-of-the practice review of waste technologies and policies) into a single, readily digestible report for review and comment by the Steering Committee prior to presentation to the County Executive. Ultimately, the Steering Committee will use the report findings to make recommendations to the County Executive as to which of the viable options should be studied further in the second phase of the study. The Study Team will keep this important function of the report at the forefront of any discussion presented therein. The Study Team's technical writers and graphic designers are accustomed to working side-by-side with multi-disciplinary experts to digest, integrate, and clearly articulate important technical information and insights.

As part of this effort, Nexight will conduct a sixth and final community workshop to present preliminary, synthesized findings from the previous workshops along with draft findings from the supplemental research and state-of-the practice review. To present this high-level summary, the Study Team will sift through the meeting results, research, and other input to develop a 45-minute PowerPoint presentation that will effectively communicate content of most interest to stakeholders. This sixth workshop is also intended to provide stakeholders with the opportunity to offer final comments for inclusion in the Phase 1 report. The Study Team Project Manager and Project Director will attend the workshop along with Nexight. Other team members may attend as necessary, based on final workshop content.

Following the completion of the sixth workshop, the Study Team will complete the Draft Phase 1 Expanded Summary Report using sharp, concise writing and high-impact graphics to maximize the impact on target audiences. The report will be submitted to the Steering Committee for review in the form of 12 hard copies (printed on a minimum of 30 percent recycled paper) and one electronic copy

(searchable pdf) that the County can post on its website. The process for review and finalization of the Phase 1 Report is described in Task 1.9.

2.2.8 Task 1.8 – Phase 1 Presentation to County Executive and County Council

The Draft Phase 1 Report will be presented to the Steering Committee and County staff during an onsite meeting. At the meeting, a draft of the PowerPoint presentation to the County Executive will be reviewed. As specified in the RFP, it is anticipated that one set of comments on the presentation from County staff and steering committee will be provided to the Study Team to finalize the presentation. As soon as practical thereafter, the presentation to the County Executive will be scheduled. A presentation shall also be given to the County Council, which may include changes requested by the County Executive. A final revision of the presentation and Phase 1 report may be required based on County Council comments.

As deliverables from this task, electronic copies (original PowerPoint and pdf) of the final presentations made to the County Executive and County Council will be provided to County staff for distribution as needed.

2.2.9 Task 1.9 – Final Phase 1 Report

The Phase 1 Extended Summary Report will be refined through a series of review cycles, including a 30-day review cycle open to County residents, two review cycles with the Steering Committee, and one review cycle with the County Executive and County Council. These review cycles will be designed to obtain maximum review and input, and build consensus and engagement while maintaining an aggressive schedule for completion of Phase 1.

During the public review cycle, the draft report will be posted online on the County's website. This will facilitate gathering of additional input needed to fill any data gaps and to solicit additional written comments from County residents and other stakeholders. It is assumed that a Steering Committee or County staff member will be appointed to track and consolidate comments received. Following Steering Committee consensus on the validity of comments, these comments will then be synthesized and provided to the Study Team for integration into the draft report.

Within each review cycle with the Steering Committee and County Executive/County Council, time will be provided for review and comment. Again, it is assumed that a Steering Committee or County staff member will be appointed to synthesize comments on which there is consensus. It is also assumed that any additional comments from the County Executive or County Council will be routed through the Steering Committee. All comments that the Steering Committee would like to have addressed will then be provided to the Study Team for integration into the draft report. Following each review cycle, the Study Team will incorporate comments and changes in a "living" electronic version of the draft report. It is assumed that this electronic copy will be posted on Geosyntec's Sharepoint website and configured to allow editorial access by the Steering Committee and selected County staff.

Once the report is finalized, the Study Team will provide the Steering Committee with 12 hard copies (printed on a minimum of 30 percent recycled paper) and one electronic copy (searchable pdf) that the

County can post on its website. Based on the Final Phase 1 Report, the Steering Committee will make recommendations to the County Executive as to which of the viable options should be studied further in Phase 2 of the study.

2.3 Phase 2 – Detailed Analysis and Projected Costs of Alternatives

Phase 2 of the study will provide detailed analysis of the promising alternatives identified in Phase 1, as recommended by the Steering Committee. It is assumed that direction to commence with Phase 2 of the study will be provided via a teleconference with the Steering Committee within 30 days of completion of Phase 1. The Study Team, headed by Geosyntec in this capacity, will review the Steering Committee's selected alternatives to determine their actual viability and the efficacy, both individually and in combination with other alternatives. As the analyses conducted in Phase 1 will already have provided a high level of critical screening to select promising technologies for consideration in Phase 2, in developing a scope of services and cost proposal for Phase 2, it is assumed that the total number of individual and combined technologies initially recommended for further study will be limited to six. It is assumed that half of these will drop out under initial screening (Task 2.1) such that only three technologies are further shortlisted to provide feedstock criteria for scoping a four-season waste sort (Task 2.2) followed by detailed analysis (Task 2.3).

Findings and recommendations from the first three tasks will be synthesizing into a Draft Phase 2 Report (Task 2.4), which will also incorporate the Phase 1 Report. After delivery of the Draft Phase 2 Report to the County, a meeting with the Steering Committee and other County personnel will be held to allow for review and refinement of the draft report prior to its presentation to the County Executive and County Council (Task 2.5), before a Final Report is prepared (Task 2.6). Should more meetings be required, additional budget may be required. The Study Team Project Manager will attend all meetings and presentations. At a minimum, the Study Team Project Director will attend meetings attended by representatives of the County Executive. Other Study Team members may attend meetings as appropriate based on the meeting agenda.

In scoping proposed tasks in Phase 2, Geosyntec has again assumed that the level of effort required to address comments will be reasonable. Should the County's comments be excessive in nature, redundant with previous draft submittals, or require Geosyntec to address issues outside the scope of the original application, Geosyntec will prepare a request for additional budget.

2.3.1 Task 2.1 – Technology Screening and Feedstock Specification

Understanding the characteristics of various components of the waste stream within a wasteshed is critical to determining the most appropriate programmatic elements of a Zero Waste program because it is the primary driver in determining the feasibility of a conversion technology project. The performance of a waste conversion technology project will be totally dependent upon the volumes/tonnage and physical/chemical characteristics of the feedstock. The most successful conversion technologies generally have the most uniform, homogenous feedstock specifications (e.g.,

particle size, materials, and moisture content). These facilities must be designed to incorporate robust feedstock preparation to remove unacceptable components. In this study, therefore, precise feedstock specifications for each technology under consideration are required, followed by waste characterization data to create a reference from which the performance (energy output, emissions output, materials recovery, etc.) can be calculated.

Instead of developing a scope for performing a generalized full waste characterization study early in Phase 2, Geosyntec recommends that a two-phased approach is adopted. Initial screening of potential conversion technologies can be performed using waste information from published sources, available databases, and existing waste/recycling data from the County and surrounding areas. Once the range of potentially implementable renewable technologies is narrowed through this screening process, the Study Team will develop feedstock material specifications for each remaining waste technology. These specifications will include the types, minimum chemical/physical characteristics (e.g., calorific value), upper- and lower-bound flow-through volumes, byproducts, and system tolerances in feedstock variability. Specifications will be based primarily on the range of manufacturer/vendor recommendations, as well as on published data.

2.3.2 Task 2.2 – Scoping Four-Season Waste Sort

Once feedstock specifications for each technology have been developed, more detailed data on the composition of waste types currently received at County waste and recycling facilities will likely need to be collected. For this, the Study Team will scope a focused waste sorting and characterization study targeted at identifying suitable feedstock. This targeted approach should mean that fewer samples will need to be taken and the data provided from each sampling event will be more representative, significantly improving the cost-effectiveness of sorting studies conducted by the County. As identified in the RFP, these sorting studies will need to be conducted over an extended period of time to capture seasonal variability in the waste stream and ensure that the data collected is fully representative.

The main deliverable from this task will be focused waste sorting and characterization protocols (comprising both preliminary checklists and detailed manual sorting procedures) tailored to identify the specific feedstock needs of targeted conversion technologies. Geosyntec has significant relevant experience in this regard, having recently developed and implemented numerous protocols to assess the quantities of separable recyclables and wet organics received in commercial waste loads as well as the quantities of high calorific value constituents of mixed waste loads for RDF production. Based on this experience and ASTM D-5231-92 (2008), "Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste," the Study Team will develop checklist procedures for field staff to use to visually and manually characterize wastes based on the feedstock criteria as well as detailed "deep-dive" manual sorting procedures for the County. Field performance of waste sorting is not included in the scope of this proposal.

2.3.3 Task 2.3 – Financial Modeling and Detailed Analysis

For each shortlisted technology or combination of technologies, the Study Team will develop a financial model that identifies the anticipated cost per ton of waste recovered (i.e., diverted, recycled, or

converted) or disposed. Various funding/financing and deal structures will be evaluated for each technology option to optimize revenue to the County while minimizing financial risk. Different project delivery and ownership options will be considered, ranging from projects solely owned and operated by the County to projects solely owned by a third-party developer, with a number of intermediary public/private and public/public partnerships and design-build (D/B), design-bid-build (DBB), and design-build-operate (DBO) options explored. Financing options examined could include revenue bonds, bank loans, grants, developer and vendor financing, tax credits and incentives, etc.

Geosyntec is regularly engaged to provide analyses and valuation services as well as strategic consulting surrounding financing, management issues, capital projects, long-term and annual budgeting for operation of integrated waste management systems, cost of service estimates, and wasteshed flow control. An existing model that Geosyntec has developed for use on previous projects will be modified for this study to generate lifecycle financial pro-forma for each technology. Modeling and evaluation of the financial feasibility of each alternative is expected to vary considerably based on the type of technology being considered:

- Costs accounted for may include, as applicable: (i) capital costs for the design, permitting, RFP development, contracting, and construction; (ii) specialized capital costs (e.g., grid interconnection for electricity generation projects); (iii) operation and maintenance (O&M) costs, including an annual escalation percentage rate; (iv) taxes; (v) leases and facility charges; (vi) insurance; and (vii) loan repayment and interest paid.
- Potential revenues accounted for may include, as applicable: (i) revenue from energy or secondary resource sales; (ii) waste receipts/gate fees; (iii) offset of County costs for energy, fuel, or other resources that are currently procured from third-party sources; (iv) reduced costs and fees for landfill or other disposal; (v) credits and incentives, including tax credits, renewable energy credits (RECs), renewable identification numbers (RINs), qualified emission reduction and carbon credits, and qualified energy conversion bonds (QECBs); (vi) environmental attributes associated with renewable technologies; (vii) other financial initiatives and grants available for social/ESJ advancements or monetization of energy efficiency improvements; and (viii) land lease payments from third-party developers.

The model allows for a variety of parameters (e.g., implementation costs, anticipated revenues, royalty payments, time scale, interest rate, discount rate, etc.) to be manipulated in sensitivity analyses.

As requested in the RFP, information received in Phase 1 of the study will be combined with the financial analysis to identify possible impediments and risk/reward scenarios for each alternative or combination of alternatives. This may include issues related to: (i) acceptability of social and environmental cost/benefits over the long term to County citizens; (ii) expected willingness of County citizens to embrace a particular technology; (ii) potential contract requirements; (iii) regulatory hurdles and need for new local legislation; (iv) impacts to municipalities and businesses; (v) permitting hurdles and challenges; (vi) the County's ability to control waste or recycling streams; (vii) effects of competition on

long-term financial viability; (viii) foreseeable changes in state or federal law; and (ix) financial risks to the County resulting from large capital intensive projects.

2.3.4 Task 2.4 – Draft Phase 2 Report

The activities in Tasks 2.1 through 2.3 will culminate in feedstock specifications and a set of financial pro-forma and recommendations for potential implementation of alternative technologies. In Task 2.4, these will be synthesized into a Draft Phase 2 Report, which will also incorporate the Phase 1 Report. The comprehensive Phase 2 Report will thus include the results and deliverables of all of the prior study tasks, descriptions of technologies, qualitative rankings for the alternative technologies that were considered, recommended technologies for implementation, suggested options for funding/financing, partnerships, contracting mechanisms, and a timeline for implementation. As such, the Phase 2 Report provides a framework for the near- and long-term process of implementing alternative technologies and waste management activities for the County and is intended to inform the County's development of a long-term waste management strategy.

The Study Team will complete the Draft Phase 2 Report using sharp, concise writing and high-impact graphics to maximize the impact on the anticipated audiences (i.e., informed, non-technical members of the community and County Executive/Council). The report will be submitted to the Steering Committee for review in the form of 12 hard copies (printed on a minimum of 30 percent recycled paper) and one electronic copy (searchable pdf) that the County can post on its website to allow residents and other stakeholders to review the report and submit comments. After submission of the Draft Phase 2 Report to the County, a meeting with the Steering Committee and other County personnel will be held to review and discuss the report. The Study Team will prepare a 45-minute PowerPoint presentation to effectively communicate the report contents. The presentation will be made by the Study Team Project Manager, while the Project Director will also attend the meeting. Other team members may attend the meeting as necessary based on the final meeting agenda. The presentation will also serve as a draft of the PowerPoint presentation to be made to the County Executive and County Council in Task 2.5.

The Draft Phase 2 Report will be refined through a series of review cycles designed to obtain maximum review and input, and build consensus and engagement while maintaining an aggressive schedule for completion of Phase 2. The Study Team understands that the County intends to provide a 45-day public comment period for the Draft Phase 2 Report. It is assumed that a Steering Committee or County staff member will be appointed to track and consolidate public comments received. Following Steering Committee consensus on the validity of comments, these comments will then be synthesized and provided to the Study Team for integration into the report. Concurrent with the public review cycle, the Steering Committee and County staff will have time to review and comment on the draft report. Again, it is assumed that a Steering Committee or County staff member will be appointed to synthesize comments on which there is consensus. All comments that the Steering Committee would like addressed will then be provided to the Study Team for integration into the draft report. The Study Team will incorporate comments and changes in a "living" electronic version of the draft report. It is assumed

this will be posted on Geosyntec's Sharepoint website and configured to allow editorial access by the Steering Committee and selected County staff.

2.3.5 Task 2.5 – Phase 2 Presentation to County Executive and County Council

After completion of the public and Steering Committee review cycles in Task 2.4, the Study Team will revise the Draft Phase 2 Report and finalize the PowerPoint presentation for presentation to the County Executive. As soon thereafter as practical, the presentation to the County Executive will be scheduled. A presentation shall also be given to the County Council, which may include changes requested by the County Executive. A final revision of the presentation and Phase 2 Report may be required based on County Council comments. It is assumed that comments received from the County Executive or County Council will be routed through the Steering Committee or County staff.

As deliverables from this task, electronic copies (original PowerPoint and pdf) of the final presentations made to the County Executive and County Council will be provided to County staff for distribution as needed.

2.3.6 Task 2.6 – Final Report

As described above, the Draft Phase 2 Report will be refined through a series of review cycles, including a 45-day review cycle open to County residents and other stakeholders, a review cycle with the Steering Committee, and review cycles with the County Executive and County Council. Once all comments have been addressed, the Study Team will prepare a Final Report incorporating both the final Phase 1 and Phase 2 Reports. As a final deliverable from the study, one electronic copy (searchable pdf) of the Final Report will be provided to the County.

2.3 Phase 3 – Development of Design-Bid-Build or Design-Build Operate Contract Documents (Contingent Item)

The requirements for Phase 3 of the study are dependent on the outcomes from Phases 1 and 2. Therefore, Geosyntec understands that scoping and pricing are not required at this time as part of this proposal submittal. However, we would be pleased to provide this information in the future.

3.0 SCHEDULE

Geosyntec understands that the County wishes to start the study in mid-June of this year and have it completed as soon as practical given the comprehensive scope. Because of the multiple opportunities afforded for citizen engagement and to solicit input to the study, the Study Teams agrees with the County's anticipated duration of the study as being in excess of six months.

Simplified Gantt charts illustrating the schedules for Phase 1 and 2 of the study are provided as Figure 1(a) and 1(b), respectively. Based on this, Geosyntec understands that Phase I will be completed at the end of January 2016. Assuming prompt direction by the Steering Committee to commence with Phase 2 within 30 days thereafter, Phase 2 is scheduled for completion by mid-July 2016. If direction to commence with Phase 2 were to be provided immediately following Phase 1, the completion date could be moved forward by about 30 days.

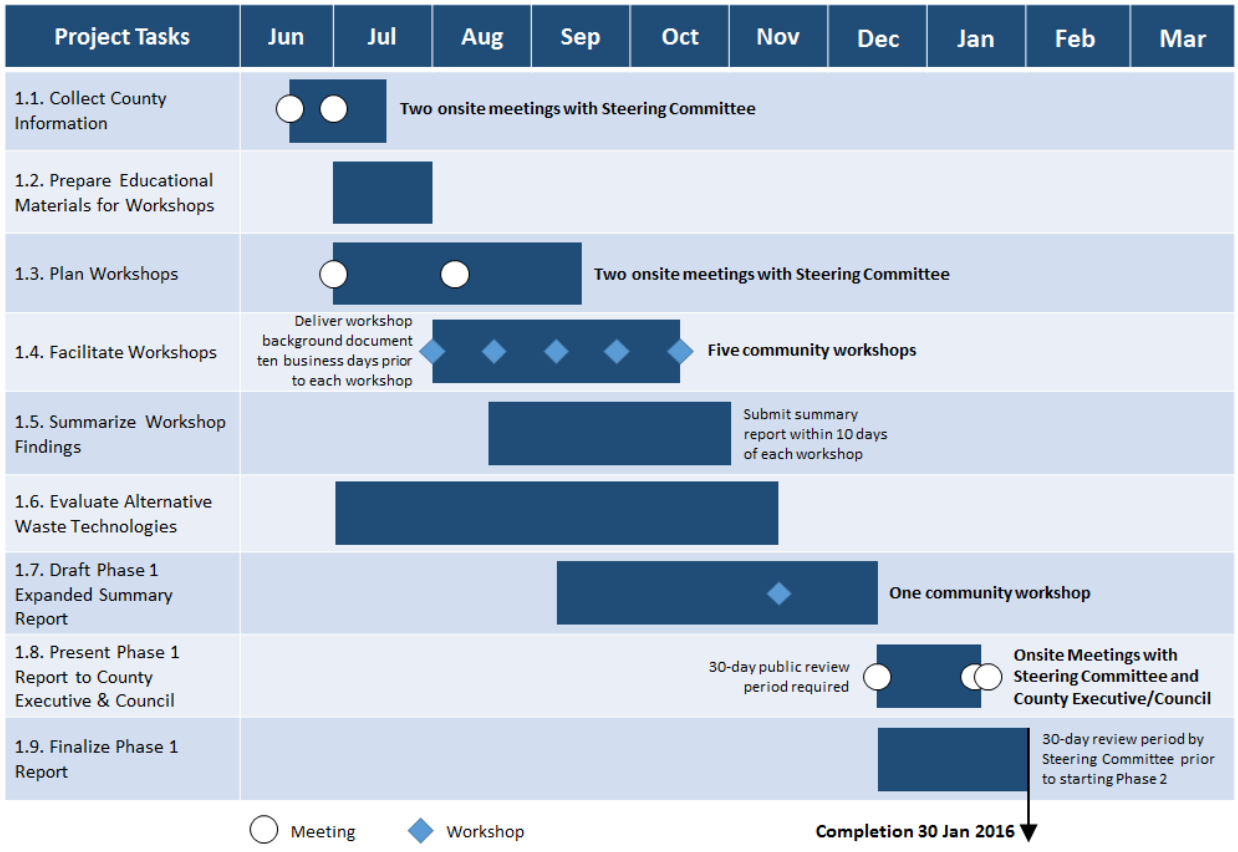


Figure 1(a): Proposed Schedule for Study Phase 1

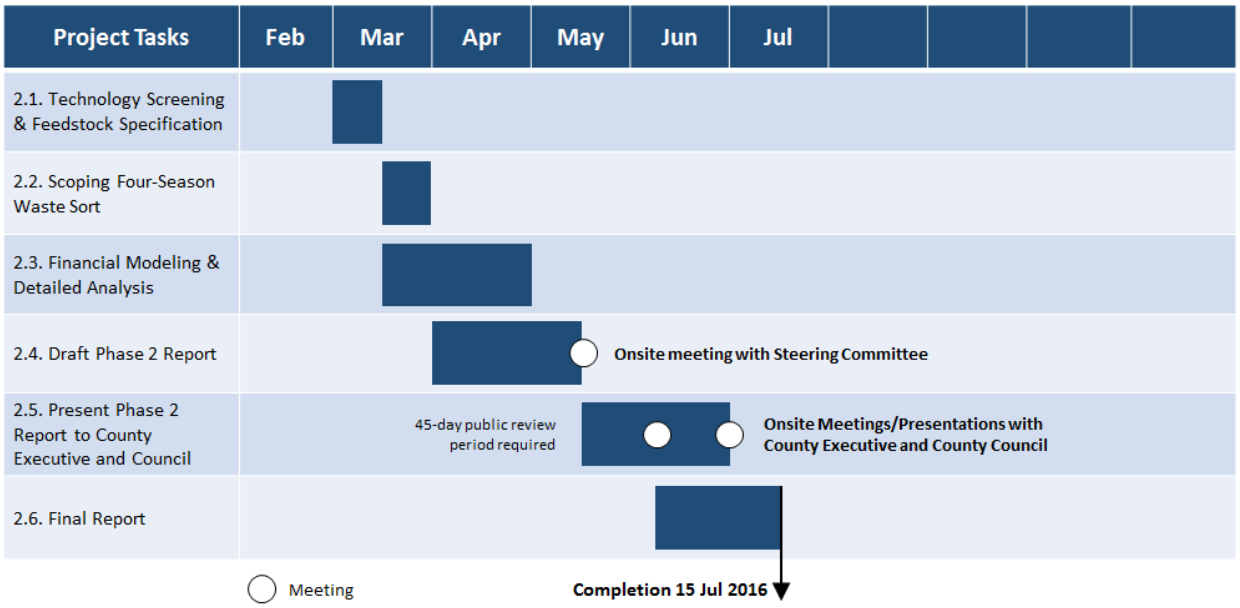


Figure 1(b): Proposed Schedule for Study Phase 2

4.0 COST PROPOSAL

Geosyntec's proposed budget for Phases 1 and 2 of this study is summarized in Table 1 below. Details regarding the budget estimate are presented in the Appendix A of this proposal. The budget was prepared in accordance with Geosyntec's approved fee schedule in our existing 2012 service agreement with the Authority. Assumptions affecting costs for the study are provided where appropriate in the discussion on scope in Section 2.

Table 1: Proposed Budget for Study

Task	Description	Budget	
Task 1.1	**Collect County Information**	**$**	**6,830**
Task 1.2	**Prepare Educational Materials for Workshops**	**$**	**2,770**
Task 1.3	**Plan Workshps**	**$**	**11,123**
Task 1.4	**Facilitate Workshops**	**$**	**18,101**
Task 1.5	**Summarize Workshop Findings**	**$**	**7,937**
Task 1.6	**Evaluate Alternative Waste Technologies**	**$**	**29,784**
Task 1.7	**Draft Phase 1 Expanded Summary Report**	**$**	**11,375**
Task 1.8	**Present Phase 1 Report to County Executive and County Council**	**$**	**8,042**
Task 1.9	**Finalize Phase 1 Report**	**$**	**13,662**
PHASE 1	**SUBTOTAL**	**$**	**109,624**
Task 2.1	**Technology Screening and Feedstock Specification**	**$**	**3,266**
Task 2.2	**Scoping Four-Season Waste Sort**	**$**	**1,818**
Task 2.3	**Financial Modeling and Detailed Analysis**	**$**	**22,080**
Task 2.4	**Draft Phase 2 Report**	**$**	**8,118**
Task 2.5	**Present Phase 2 Report to County Executive and County Council**	**$**	**2,856**
Task 2.6	**Final Report**	**$**	**6,012**
PHASE 2	**SUBTOTAL**	**$**	**44,150**
	TOTAL	**$**	**153,774**

Based on the above, the breakdown in budget allocated to each partner firm is summaried in Table 2. As seen in the table, this is a true partnership between experts with Geosyntec accounting for only 53%

of the total. Nexight, the workshop facilitors, accounts for 34% of the budget while Goldsmith accounts for the remaining 13%.

Table 2: Proposed Budget Allocation between Study Partners

Role	Description	Budget	
Prime	**Geosyntec Consultants**	**$**	**82,074**
Sub	**Nexight Group**	**$**	**52,500**
Sub	**A. Goldsmith Resources**	**$**	**19,200**

Finally, as required in the RFP, Geosyntec has also accounted for the following contingency hours of staff time to be used at the direction of County staff:

- Phase 1:
  - 20 hours for final revision of the presentation and Phase 1 report based on County Council comments (20 hours @ $185/hour = $3,700)
- Phase2:
  - 20 hours for revision of the Phase 2 Final Report based on County Council comments (20 hours @ $185/hour = $3,700)
  - 15 hours for preparation and attendance at County Council meetings and addressing comments from the County Council (15 hours @ $185/hour = $2,775)

Based on the above, a total contingency of 55 hours and $10,175 should be assumed.

5.0 STUDY TEAM ORGANIZATION AND REPRESENTATIVE EXPERIENCE

5.1 Organization of the Study Team

Geosyntec recognizes that successful execution of any multi-faceted project depends to a significant degree on a strong management approach. As illustrated on Figure 2, Geosyntec will manage the study at three main levels:

- An experienced Project Director (Mr. Thomas Ramsey, P.E.) with a solid record of successful completion of projects, including several projects completed under the on-call contract with the Authority
- A strong, proactive, and experienced Project Manager (Mr. Jeremy Morris, Ph.D., P.E.) with highly credentialed and directly relevant technical experience and a demonstrated capacity for managing and implementing multiple assignments simultaneously
- Task Leaders, who were specifically selected for their professional skills and are extremely well-qualified and experienced to lead technical assignments

The objective of this organizational approach is to use the technical capabilities and experience of each Study Team member to the greatest advantage.

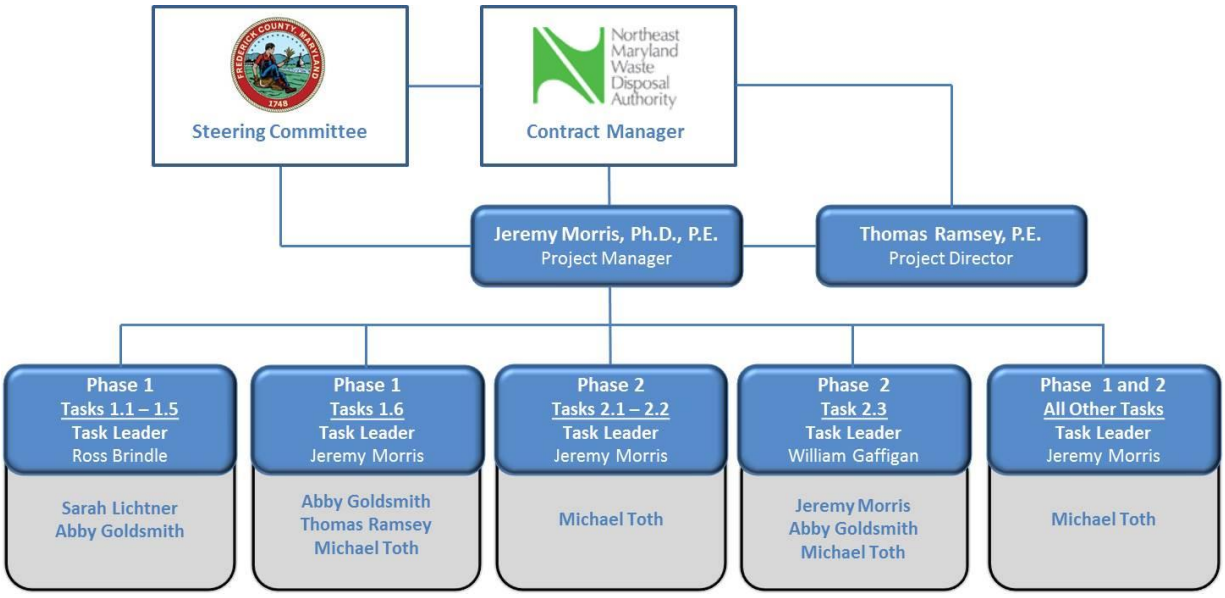


Figure 2: Proposed Organizational Chart

5.2 Project Management Procedures and Tools

Cognizant of the fast-paced schedule and multi-disciplinary approach to the study in which a number of different tasks will be underway concurrently, Geosyntec will implement a robust program management program in the areas of budget and schedule control, quality control, and communications management. Geosyntec uses well-established project management procedures and tools to successfully plan and execute our project work. Our project management approach is an important contributing factor to our service level reputation with our clients. The key elements of our project management approach to successfully complete projects include:

- Task-specific schedule and budget assignment and management to provide for detailed cost control and project administration during execution of the work
- Quality assurance and control provided through an institutional Quality Management Program (QMP)
- Philosophy of working in a team-oriented, cooperative manner across all tasks in each category of project assignments (i.e., technical, financial, legal)
- Active communication and engagement, both internally and with our clients and other project stakeholders

Geosyntec, as well as other members of the proposed Study Team, are very experienced working on projects with aggressive schedules, often driven by hard deadlines for investment or divestment decisions, mergers and acquisitions, consent decrees, or looming regulatory changes, litigation, or negotiated agreements. We understand the importance of communication in studies such as these in which stakeholder input is key. Geosyntec fully respects that the true measure of success is not only technical quality and cost effectiveness of the solution provided but also meeting schedule commitments to stakeholders.

5.3 Key Personnel

Geosyntec has assembled a multi-disciplinary team of highly qualified professionals for this study. As outlined below, our Study Team includes experts in every field identified in the RFP. Resumes for all Study Team members are presented in Appendix B.

5.3.1 Project Director – Thomas Ramsey, P.E.

Tom Ramsey, a Registered Professional Engineer in the State of Maryland and an Associate with Geosyntec based in Columbia, Maryland, will serve as Project Director. In this role, he will supervise peer and senior review of all work products, verify compliance with the contract terms, schedule, and budget, and ensure the requisite level of quality is provided on all work products.

Tom will also serve a supporting role as a senior technical resource for the work associated with understanding waste pre-processing and feedstock preparation and capital operating expenditures on different waste technologies. He will focus on the effects of waste collection and handling constraints, potential tariff structures and fees, and site-specific characteristics on the future operational and construction costs of different technologies. Prior to joining Geosyntec in 2002, a significant portion of Tom's 25-year career in solid waste management was with private solid waste companies where he managed numerous solid waste processing and disposal operations and capital projects, which has provided him with first-hand experience with the impacts of site characteristics and waste collection and handling constraints on economic and operational performance. He brings in-depth knowledge of planning and development of many types of solid waste facilities, including landfills, transfer stations, material recovery facilities (MRFs) and truck maintenance facilities.

5.3.2 Project Manager – Jeremy Morris, Ph.D., P.E.

Jeremy Morris, a Senior Engineer in Geosyntec's Columbia, Maryland office and Registered Professional Engineer in the State of Maryland, will serve as Project Manager. In this role, he will coordinate the work of the Study Team and be responsible for all deliverables in accordance with requisite levels of quality. He will ensure that schedules and budgets are met and serve as the primary contact with the Authority and County. As indicated on Figure 2, Jeremy will also serve as Task Leader for several technical components of the work associated with both phases of the study.

Jeremy has over 16 years' experience in environmental engineering and solid waste management and well-credentialed academically as a leader on research studies. His Ph.D. research work involved investigation of anaerobic degradation processes, landfill hydrological properties, pollution potential, and time to stabilization. A regular participant at technical symposia, he is actively engaged in teaching and speaking at meetings and workshops for regulatory and profession associations. He has served as lead investigator on several U.S. EPA research studies and is a nationally recognized leader in the fields of sustainable landfill management and post-closure care with extensive experience with beneficial redevelopment of former landfills and brownfield sites as platforms for renewable energy (solar, wind, gas-to-energy, and geothermal).

Jeremy has served important technical and managerial roles on dozens of solid waste projects for both private and public clients. For example, since 2005 he has served an ongoing project management role for various investigation, planning, permitting, and construction activities for Dorchester County, Maryland. His responsibilities have included overseeing maintenance of the County's ten-year Solid Waste Management Plan, site investigations, landfill engineering design, permit application, conducting public review meetings for permit approvals, and ancillary permitting issues, including for air quality and greenhouse gas (GHG) emissions monitoring and reporting. Jeremy has comprehensive experience with market valuations, cost estimating, cash flow analyses, and feasibility studies for landfill gas-to-energy projects.

5.3.3 Other Geosyntec Personnel

William Gaffigan, MBA, CVA, an Associate with Geosyntec and senior financial modeler and project economist experienced in waste projects, will lead the Study Team in financial modeling and cost-benefit analyses. A Certified Valuation Analyst (CVA), Bill has more than 25 years of experience in the solid waste sector as an advisor for a range of purposes including mergers and acquisitions, divestitures, litigation support, due diligence, eminent domain, dissenting shareholder suits, and minority shareholder oppression. He offers specialized capabilities in financial analysis, valuation, business transactions, and strategic business consulting. Bill has valued hundreds of facilities, sites and companies from a broad range of industries with particular focus on the environmental industry and has gained transaction experience through the successful closing of more than 60 transactions ranging from $500,000 to $100 million in size, most involving solid waste assets. His solid waste client base extends from landfills to hauling, recycling, composting, medical waste, sludge, and biogas sectors.

Nationally, Bill is one of the few certified valuation professionals with extensive experience spanning a wide range of segments in the environmental industry. He has provided advisory services encompassing operations analysis, financial analysis and policy recommendations to improve the performance of an integrated waste transfer, disposal and recycling system; valuation advisory services to support the refinancing of a large solid waste recycling and transfer facility, including market study, financial analysis, and formal valuation to develop a conclusion of value on the asset.

Geosyntec's team will be supported by a number of staff and project professionals, most notably **Michael Toth.** Mike is an environmental engineer with burgeoning experience in the design and evaluation of water/wastewater treatment systems, several aspects of solid waste management, diversion, and disposal, and air pollution prevention and control system design. His technical expertise specifically includes life cycle assessments (LCAs) of solid waste facilities and asset development, renewable energy technology development (particularly for redevelopment of former landfill sites and brownfields). Prior to joining Geosyntec, Mike worked with Waste to Energy Partners, LLC, an independent start-up company specializing in solid waste conversion technologies such as combustion, pyrolysis, and multiple variants of gasification and the Fischer-Tropsch process for the production of waste-derived fuels.

5.3.4 Nexight Group, LLC

Ross Brindle, Executive Vice President, will serve as Lead Workshop Facilitator for the Study Team. Ross is an internationally recognized expert in facilitating high-level consensus-building strategy workshops, having led more than 350 such workshops on six continents. He oversees private and non-profit client work focusing on energy, climate change, manufacturing, innovation, and global development issues. He has led strategic planning efforts for companies and

government agencies large and small as well as for entire industries, including metals and chemicals production, advanced automotive materials, cyber security of electric grid control systems, and a variety of energy production technologies. Ross also helps R&D programs plan, execute, measure, and communicate results more effectively. He has recently created and delivered a three-day training course on energy technology road-mapping methods and practices to government and university leaders in Singapore, in support of Singapore's National Innovation Challenge. He has also worked with the materials science community to assess opportunities for materials innovations to save energy, reduce emissions, and strengthen the U.S. economy, and assessed the greenhouse gas emissions produced by propane and alternate energy sources in residential, commercial on-road, off-road, and agriculture applications.

Sarah Lichtner, Technical Writer and Editor, will serve as Assistant Workshop Facilitator. Sarah writes and edits a variety of communication materials, including proposals, fact sheets, reports, case studies, and website content, on a multitude of technical topics, including materials science, manufacturing, energy, climate change, and biological science. She specializes in organizing and presenting vast amounts of technical information to convey key messages concisely, clearly, and accurately. She manages large, time-intensive projects with precision and produces polished, well-researched products that communicate and persuade effectively.

Ms. Lichtner recently served as lead author on *Advancing Thermal Manufacturing: A Technology Roadmap to 2020*, an effort that was led by ASM International and funded by the National Institute of Standards and Technology (NIST) Advanced Manufacturing Technology Consortia (AMTech) program. She recently coordinated documentation and report preparation for the Carbon Storage Program peer review for the National Energy Technology Laboratory's Office of Clean Coal Program, and eight other NETL peer reviews. She has also led the organization and editing of the Innovation Impact Report, the culminating report of the study Linking Transformational Materials and Processing for an Energy-Efficient and Low-Carbon Economy. She has also provided analytical and communications support to the American Society of Mechanical Engineers; The Minerals, Metals & Materials Society (TMS); and the American Chemistry Council.

5.3.5 A. Goldsmith Resources, LLC

Abby Goldsmith, Principal at A. Goldsmith Resources, **will serve as a Senior Consultant** to the Study Team, with primary focus on the state-of-the-practice review of alternative waste technologies and policies in Task 1.6. With over 29 years' experience, Abby assists state and local governments, trade associations, and businesses to reduce and manage solid waste more sustainably. She has developed and implemented waste reduction, recycling, and solid waste management programs for numerous facilities and jurisdictions across the country. An expert with the knowledge that comes only from first-hand experience, coupled with the ability to communicate the

message to any audience, Abby provides recommendation for waste reduction, recycling and solid waste management strategies based on client objectives and an assessment of current practices, partnering with clients to implement selected strategies through changes in operations and policies, procurement or renegotiation of contracts for facilities or monitoring progress.

Abby currently serves as the co-chair of the Atlanta Recycles Steering Committee and is an Honorary Board Member of the Georgia Recycling Coalition, having served as its founding President. She developed and has conducted training modules on solid waste planning, financing and waste reduction for the Georgia chapter of the Solid Waste Association of North America for the past 20 years and is a frequent presenter at state, regional, and national sustainability, recycling, and solid waste management conferences. She currently serves as co-chair of the Atlanta Recycles Steering Committee, was the first President of the Georgia Recycling Coalition, and is a founding board member of the New York State Association for Recycling.

5.4 Representative Experience

Geosyntec has assembled a multi-disciplinary team of highly qualified professionals from three firms to provide the services described in the RFP. The Study Team assembled for this project, with Geosyntec as the prime consultant supported by professionals from our two specialty sub-consultants Nexight and Goldsmith, includes experts in: (i) solid waste management practices and operations; (ii) planning and strategy consulting for solid waste systems; (iii) technical and economic feasibility of evaluations of alternative technologies for waste conversion and recovery; (iv) environmental regulations, permitting, and policies as they pertain to waste management and recycling; (v) workshop facilitation and engaging stakeholder input. Geosyntec's practitioners foster strong connections with industry associations, including:

- SWANA (Solid Waste Association of North America)
- ASCE (American Society of Civil Engineers)
- ISWA (International Solid Waste Association)
- IWWG (International Waste Working Group).

Geosyntec is an industry partner with the U.S. EPA's Landfill Methane Outreach Program (LMOP). Professionals from our Columbia, Maryland office routinely serve as officers with the Mid-Atlantic Chapter of SWANA and have made technical contributions at the Maryland Recycling Network (MRN) annual conference. We have deep solid waste project experience in Maryland and are very well known and respected by senior solid waste officials within the Maryland Department of the Environment. A brief introduction to the relevant experience of Geosyntec and our partner firms is provided in the remainder of this section. Additional details are provided in Appendix C.

5.4.1 Solid Waste Practices and Operations

With over 30 years of service, Geosyntec's solid waste professionals have been involved in more than 1,000 solid and hazardous waste management projects, with lifecycle services to clients including asset

acquisition and divestment, pre-development planning and impact assessment, engineering design and permitting, bidding and procurement, construction management and quality assurance, operation and compliance, and renewable energy development and carbon emission reductions. On the operational side, we have provided technical and financial reviews of integrated waste management systems, disposal optimization, and wasteshed flow control. We understand that fully integrated solid waste management and recycling services (i.e., collection through diversion/disposal) are highly complex operations that involve coordinated and sometimes competing interests involving trucking, heavy equipment, construction, maintenance, finance, and personnel management. Our professionals are familiar with the specific challenges posed by integrated solid waste operations. This experience includes real-world forensic and operating experience from dozens of MRFs and waste handling facilities, resulting in first-hand knowledge of the common pitfalls affecting solid waste management facilities and their operations. Conversely, we have also worked closely with dozens of clients that operate efficient and well-managed solid waste operations, and so recognize the standards for good practice. We are often called on to provide designs for structures that are intended to fix issues that are operational in nature, we understand the limitations of engineering and where close operational, financial, and management control is essential for a facility to perform well.

As an example, Geosyntec recently reassessed the master plan for Cecil County, Maryland to incorporate lifecycle revenue and expense costs associated with construction and operation of alternative waste processing facilities (e.g., composting, materials recovery) into the financial schedule for sequential development of the Central Landfill site. The updated plan enables critical assessment of proposed on- or off-site facilities (e.g., transfer stations) or operations (e.g., waste separation) to evaluate whether they represent optimal use of resources or whether alternative facilities or waste pre-processing options would better serve current and future needs. The plan also allows the County to modify plans in response to various timelines for implementing the State's proposed Zero Waste regulations. The main deliverable was a flexible and interactive MS Excel® decision tool for developing a holistic waste management strategy for the county.

5.4.2 Solid Waste Planning and Strategy Services

A. Goldsmith Resources, LLC is a national leader in sustainable materials management and developing strategies to accomplish financial and environmental goals established with stakeholders and preparing action plans to detail how the strategy will be implemented. These plans serve to identify and quantify materials that could be diverted for recycling or serve as feedstock for recovery and conversion facilities. Once a strategy has been identified and agreed, Goldsmith develops online tools and training manuals to educate elected officials, senior managers, recycling coordinators, and other stakeholders about the strategy. Goldsmith also develops performance metrics against which to measure the success of new strategies and identify where improvements can be made. Recent project examples include:

- **Measure Georgia (Georgia Recycling Coalition)**: Managed and led campaign to resurrect measurement of recycling in the State to demonstrate that recycling continues to provide economic and environmental benefits in the State of Georgia

- **Cost Evaluation of Recycling and Transfer Options (Beaufort County, South Carolina)**: Provides ongoing support to Beaufort County Public Works, guiding staff and elected officials on ways to reduce costs of collection, recycling, and disposal
- **Economics of Recycling Model Development (Ohio State University)**: Advisor on a project to develop tools for decision makers to use to quantify the benefits of various approaches to recycling

Goldsmith has also completed dozens of solid waste management plans for states, counties, and municipalities. Additional details are provided in Appendix C and are available online at www.agoldsmithresources.com.

Geosyntec has assisted several private and public solid waste clients with planning studies and public communication strategies. Recent examples completed by Geosyntec's proposed Study Team Project Manager include:

- **Comprehensive Solid Waste Management Plan (Dorchester County, Maryland):** In 2006, Geosyntec completely revised and updated the 10-year Comprehensive Solid Waste Management Plan (SWMP) for Dorchester County, Maryland in accordance with Code of Maryland Regulations (COMAR) 26.03.03.02-04. Since that time, we have made regular updates to the SWMP to meet new Maryland statutes (e.g., meeting recycling mandates under the Maryland Recycling Act) and address other changes to solid waste management needs in the county, and have represented the County in several public hearings and County Council meetings.
- **Environmental Protection at Modern Solid Waste Landfills (Waste Management, Inc.):** This innovative document is intended primarily for public communication on the operational oversight and protectiveness of the modern managed landfill operation. The document is specifically developed to be engaging to a non-technical audience, with widespread use of colorful graphics, illustrations, and call-out boxes. Each chapter is intended to be largely self-contained for readers interested in particular topics. Symbols are used throughout to allow the reader to page through the document to find information on a specific topic.

We are also regularly engaged to provide strategic consulting on financing, management issues, waste-to-energy and alternative waste conversion technology project investments, and capital projects.

5.4.3 Workshop Facilitation and Community Outreach

A Maryland-based small business, Nexight, combines highly experienced workshop planning and facilitation, data collection and analysis, and award-winning technical communications to capture consensus-driven results in a structured and logical framework that prompts action. The company's collective portfolio includes hundreds of workshops and meetings. The group's facilitators capture consensus-driven results in a structured and logical framework that prompts action. Examples of successful projects completed are provided in Appendix C.

5.4.4 Financial and Operational Assessment and Planning

We are regularly engaged to provide valuation services for solid waste assets and have provided financial analysis for long-term and annual budgeting of integrated waste management systems, cost of service estimates, and closure and post-closure reserves. We have performed valuation studies and cost-benefit analyses for internal and third-party collection/diversion/disposal alternatives. We have also assisted solid waste facility operators in optimizing fee pricing as well as helped waste producers and haulers in their fee negotiations for waste disposal.

As an example, in 2014 the Solid Waste Authority of Central Ohio (SWACO) retained Geosyntec's Tom Ramsey and Bill Gaffigan to provide an independent assessment of their operations, capital planning, and maintenance challenges. SWACO manages over a million tons of solid waste annually through an integrated regional network of waste collection, processing, transfer, and disposal assets. Geosyntec's approach was to review and separate operations that were generally well-run and efficient from those needing improvements. For the latter, we develop prioritized, actionable recommendations for improving operational efficiency and achieving cost reductions. We made recommendations for operational improvements based on implementation of best management practices (BMPs) where these were lacking, improving organizational structure, overhauling budgeting procedures and cash flow tracking systems, and improving data collection and management systems. We also provided SWACO with a revised capital planning model and approach to implement risk reduction strategies.

In another example, Geosyntec performed a life-cycle financial analysis for a proposed C&D landfill in Virginia Beach, Virginia. This required development of an economic model capable of assessing multiple scenarios to consider the cost to build and operate the landfill, the expected revenue stream, and the timing of the expected major expenditures. Geosyntec performed a detailed audit of the regional waste stream, population dynamics, volume of construction activity, and existing facilities in the proposed area of service. Based on this, Geosyntec was able to develop an accurate model of expected market share versus tipping fee for the proposed facility. Geosyntec also performed a financial forecast of revenues and expenses to estimate the residual value of the facility at any time during its remaining service life.

5.4.5 Alternative Waste Management Technologies

Geosyntec and Goldsmith have experience providing a wide range of technical services associated with determining the feasibility of emerging technologies, including waste audits, field studies, literature reviews, and financial feasibility reviews associated with materials recovery from waste streams. We have helped guide a number of public sector clients to objectively and scientifically review available technologies in order to help them successfully select new or emerging technologies for their consideration. Examples of relevant projects in key sectors are summarized below.

- **Composting**: Geosytnec recently completed a composting feasibility study for Robins Air Force Base (AFB), Georgia as an opportunity to reduce waste disposal costs and meet federal goals to divert waste from landfills through source reduction and/or reuse. We evaluted whether sewage sludge could be blended with the current feedstock to the composting operation. This included a detailed characterization of the sludge, a cost-benefit analysis, and mass balance

calculations to evaluate the weight of sludge that could be utilized annually. General characteristics of the other composting feedstock components (yard trimmings, tree cuttings, and horse stable waste) were used in an iterative and stepwise process to recommend component ratios, or compost "recipes," for the composting operation plan.

- **Gasification/Plasma Systems**: Geosyntec conducted a detailed evaluation of the technical, regulatory, and economic feasibility of installing a plasma gasification facility for Robins AFB. We considered several options that included different facility capacities, importing off-base waste, and private developer participation. The financial analyses considered capital costs, operation and maintenance costs, feedstock cost, waste disposal cost savings, value of net electricity, renewable energy credits, carbon emission reduction credits, value of recovered metal and slag, and tax credits. We also have experience with operational performance of gasification plants, for example at a demonstration-scale gasification facility in Ottawa, Ontario. The system accepts post-recycled MSW directly from curbside packer trucks and produces a refined syngas stream to power electrical generators. Syngas cooling and cleaning is achieved using a series of water quench and chemical scrubbing processes. During operation, water discharge issues can arise related to both organic and inorganic parameters. At this site, issues with the 100 gpm recovered water treatment system resulted in the water being disposed of at a cost of $25,000 per day. Within two weeks Geosyntec was able to make operational and process changes to reduce this cost by 90%.
- **Anaerobic Digestion**: In addition to designing several major anaerobic digestion (AD) processes for industrial clients, we have presented talks and helped educate legal and insurance firms about AD technology, design risks, and key due diligence issues for increased scrutiny. Geosyntec also has substantial experience trouble-shooting process upsets. In a recent example, a JR Simplot food processing plant was experiencing a bioprocess upset that was causing the downstream wastewater treatment plant to exceed its compliance limits. The local municipality proposed a short-term remedy at a cost of more than $1 million. Immediate measures were devised to bring the municipal system into compliance within 24 hours of implementing, and to bring the Simplot facility into compliance within one week. A temporary polishing system was constructed to provide further process security. The remedy costs, including all temporary works, resulted in savings of $700,000. Root cause investigation, including assessing the roles of oil and grease and micronutrients is ongoing.

We understand the energy value of MSW in different applications. A significant component of Geosyntec's solid waste landfill practice relates to LFG management and landfill gas-to-energy (LFGTE) projects, with lifecycle services ranging from technical/financial feasibility studies and market analyses to design, permitting, and construction oversight to post-development compliance, monitoring, and operational oversight and troubleshooting. We work with owners and energy project developers to evaluate potential revenues from methane utilization and have assisted our clients in taking advantage of the financial benefits associated with control of carbon-equivalent LFG emissions. For example, at the Seminole Road Landfill in Atlanta, Georgia, Geosyntec helped the owner expand methane utilization from a 3.2MW LFGTE facility to include an additional renewable natural gas (RNG) conversion facility,

two compressed natural gas (CNG) fueling stations, and purchase of 50 CNG fuel vehicles. Geosyntec evaluated the feasibility of various RNG and CNG conversion technologies, helped the owner secure $15 million in grant funding, supported bid selection during the tender process, provided construction oversight and management, and provides ongoing operational review and reporting services. The U.S. EPA selected this project for the Project of the Year Award at the 2013 national LMOP Conference.

5.4.6 Waste Characterization Studies

Geosyntec has the necessary experience in designing waste sorting protocols and conducting the technical engineering waste characterization studies specifically for conversion technologies. Our experience is based on actual facility design and facility operating data requirements. Geosyntec has managed and performed dozens of waste composition and waste characteristics studies, both to evaluate the waste streams and to determine waste properties for subsequent analyses. Recent examples performed by staff from Geosyntec's Maryland office include:

- **Waste Composition Study for Recovery of Recyclables**: Recognizing an opportunity to recover recyclables from their mixed waste streams, our client turned to Geosyntec to better understand the volume and types of materials that could be recovered at their existing transfer station and MRF facilities prior to making a high cost investment. We performed a waste composition analysis at three facilities in the Mid-Atlantic region using an alternative field investigation methodology that would provide actionable information at substantially less cost. Knowing the five to eight recyclable materials that are targeted by automated recovery equipment and coupling this information with the fact that wastes are typically collected using regular, repeated routes, Geosyntec performed a rapid initial screening of our client's customers to identify wet, commingled wastes that would have little recoverable material, and instead focus on routes dominated by dry wastes.
- **Waste Composition Study for Waste Pelletization**: Geosyntec was retained to perform a field study of the composition of residential and commercial wastes received at select landfills and transfer stations in terms of calorific value (primarily plastic and paper content). The data were used in support of developing waste-to-energy pelletizing plants. Studies were competed at two sites in California, one site in Maryland, three sites in Illinois, and one site in Pennsylvania. Geosyntec evaluated the collected data to estimate the average heat content of the waste stream received at each facility and assess the value of the waste received as bulk feedstock to the proposed pelletizing program, which intends to refine the waste to produce a high-value, process engineered fuel with predictable and uniform heat content.

5.5.6 Solid Waste Experience in Maryland

Through our extensive project work at solid waste facilities in Maryland (Figure 3), Geosyntec has developed and maintained excellent reputations with local regulators and the Maryland Department of the Environment. Geosyntec has a record of accomplishment for each project of developing comprehensive work plans and designs that are well received by regulators, ready to implement, streamline the regulatory review and permitting process, and promote efficient construction.

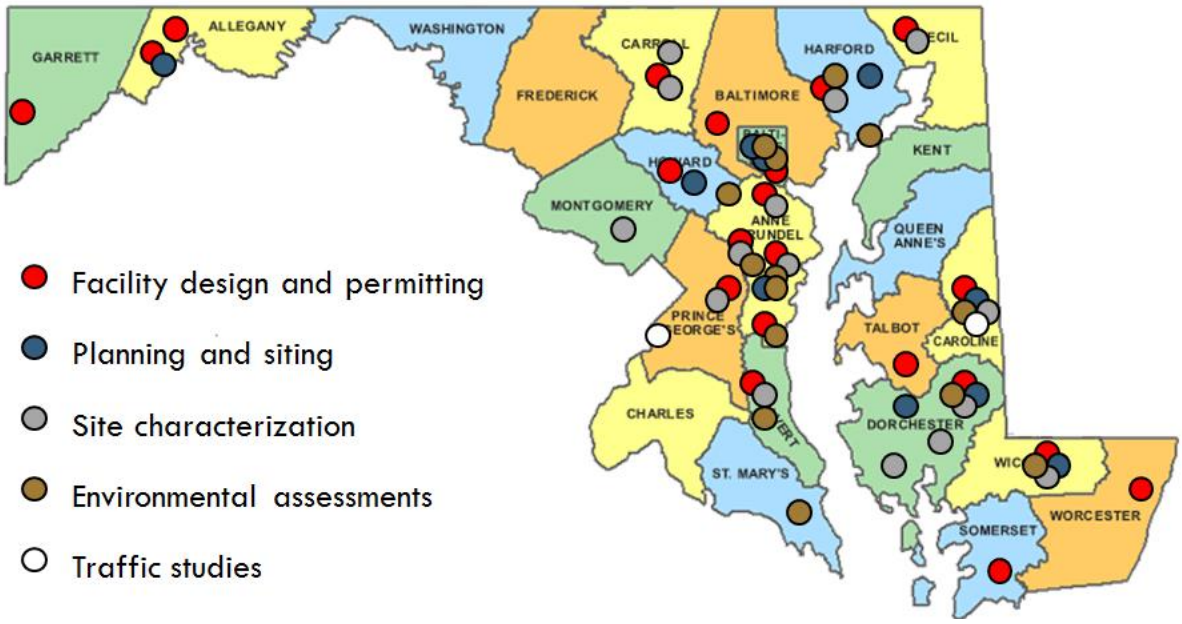


Figure 3: Geosyntec's Solid Waste Experience in Maryland

Since 2001, Geosyntec has provided solid waste engineering services to Harford, Carroll, Howard, and Montgomery Counties through contracting mechanisms with the Authority. To date, we have successfully completed ten such projects.

APPENDIX A

COST PROPOSAL

BUDGET ESTIMATE

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

	Description		Cost
Task 1.1	**Collect County Information**	**$**	**6,830**
Task 1.2	**Prepare Educational Materials for Workshops**	**$**	**2,770**
Task 1.3	**Plan Workshps**	**$**	**11,123**
Task 1.4	**Facilitate Workshops**	**$**	**18,101**
Task 1.5	**Summarize Workshop Findings**	**$**	**7,937**
Task 1.6	**Evaluate Alternative Waste Technologies**	**$**	**29,784**
Task 1.7	**Draft Phase 1 Expanded Summary Report**	**$**	**11,375**
Task 1.8	**Present Phase 1 Report to County Executive and County Council**	**$**	**8,042**
Task 1.9	**Finalize Phase 1 Report**	**$**	**13,662**
PHASE 1	**SUBTOTAL**	**$**	**109,624**
Task 2.1	**Technology Screening and Feedstock Specification**	**$**	**3,266**
Task 2.2	**Scoping Four-Season Waste Sort**	**$**	**1,818**
Task 2.3	**Financial Modeling and Detailed Analysis**	**$**	**22,080**
Task 2.4	**Draft Phase 2 Report**	**$**	**8,118**
Task 2.5	**Present Phase 2 Report to County Executive and County Council**	**$**	**2,856**
Task 2.6	**Final Report**	**$**	**6,012**
PHASE 2	**SUBTOTAL**	**$**	**44,150**
	TOTAL	**$**	**153,774**

Rates

Professional Category	Hourly Rate
Principal	$ 224
Project Manager	$ 206
Senior Engineer	$ 185
Project Engineer	$ 164
Staff Engineer	$ 109
Clerical	$ 58
Senior Technician	$ 83
Field Technician	$ 62

and Fees

Mark-up on Direct Costs	0%
Mark-up on Subcontractor Costs	0%

Note: Rates are consistent with the 2012 on-call services agreement with the Northeast Maryland Waste Disposal Authority

Task 1.1
Collect County Information

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ 4,000	L/S		$ 4,000
Project Manager	$ 206	Hrs.	2	$ 412		Sub: A. Goldsmith LLC	$ 1,200	L/S		$ 1,200
Senior Engineer	$ 185	Hrs.	6	$ 1,110						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	160	$ 92
Staff Engineer	$ 109	Hrs.	0	$ -		Reproduction	$ 0.08	page	200	$ 16
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 1,522**				**Direct Expenses**		**$ 108**
								Subconsultant expenses		$ 5,200

TOTAL TASK **$ 6,830**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Meet with Steering Committee		2	4					
Review of Data Collection			2					
Total Hours	**0**	**2**	**6**	**0**	**0**	**0**	**0**	**0**

Task 1.2
Prepare Educational Materials for Workshops

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ 2,000	L/S		$ 2,000
Project Manager	$ 206	Hrs.	0	$ -		Sub: A. Goldsmith LLC	$ 400	L/S		$ 400
Senior Engineer	$ 185	Hrs.	2	$ 370						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile		$ -
Staff Engineer	$ 109	Hrs.	0	$ -		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 370**				**Direct Expenses**		**$ -**
								Subconsultant expenses		$ 2,400

TOTAL TASK **$ 2,770**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Review Materials			2					
Total Hours	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**

Task 1.3
Plan Workshops

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ 9,500	L/S		$ 9,500
Project Manager	$ 206	Hrs.	1	$ 206		Sub: A. Goldsmith LLC	$ 400	L/S		$ 400
Senior Engineer	$ 185	Hrs.	5	$ 925						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	160	$ 92
Staff Engineer	$ 109	Hrs.	0	$ -		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 1,131**				**Direct Expenses**		**$ 92**
								Subconsultant expenses		$ 9,900
TOTAL TASK				**$ 11,123**						

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Meet with Steering Committee			4					
Review Workshop Plans		1	1					
Total Hours	**0**	**1**	**5**	**0**	**0**	**0**	**0**	**0**

Task 1.4
Facilitate Workshops

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ 17,500	L/S		$ 17,500
Project Manager	$ 206	Hrs.	0	$ -		Sub: A. Goldsmith LLC	$ -	L/S		$ -
Senior Engineer	$ 185	Hrs.	3	$ 555						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	80	$ 46
Staff Engineer	$ 109	Hrs.	0	$ -		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 555**				**Direct Expenses**		**$ 46**
								Subconsultant expenses		$ 17,500

TOTAL TASK **$ 18,101**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Attend Workshop			3					
Total Hours	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**

Task 1.5
Summarize Workshop Findings

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ 7,500	L/S		$ 7,500
Project Manager	$ 206	Hrs.	1	$ 206		Sub: A. Goldsmith LLC	$ -	L/S		$ -
Senior Engineer	$ 185	Hrs.	1	$ 185						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	80	$ 46
Staff Engineer	$ 109	Hrs.	0	$ -		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 391**				**Direct Expenses**		**$ 46**
								Subconsultant expenses		$ 7,500

TOTAL TASK **$ 7,937**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Review Workshop Summaries		1	1					
Total Hours	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**

Task 1.6
Evaluate Alternative Waste Technologies

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ -	L/S		$ -
Project Manager	$ 206	Hrs.	8	$ 1,648		Sub: A. Goldsmith LLC	$ 12,000	L/S		$ 12,000
Senior Engineer	$ 185	Hrs.	40	$ 7,400						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile		$ -
Staff Engineer	$ 109	Hrs.	80	$ 8,720		Reproduction	$ 0.08	page	200	$ 16
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 17,768**				**Direct Expenses**		**$ 16**
								Subconsultant expenses		$ 12,000

TOTAL TASK **$ 29,784**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Review Technologies		8	40		80			
Total Hours	**0**	**8**	**40**	**0**	**80**	**0**	**0**	**0**

Task 1.7
Draft Phase 1 Expanded Summary Report

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ 3,500	L/S		$ 3,500
Project Manager	$ 206	Hrs.	2	$ 412		Sub: A. Goldsmith LLC	$ 1,200	L/S		$ 1,200
Senior Engineer	$ 185	Hrs.	19	$ 3,515						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	80	$ 46
Staff Engineer	$ 109	Hrs.	20	$ 2,180		Reproduction	$ 0.08	page	100	$ 8
Clerical	$ 58	Hrs.	8	$ 464		Shipping	$ 50	L/S	1	$ 50
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 6,571**				**Direct Expenses**		**$ 104**
								Subconsultant expenses		$ 4,700

TOTAL TASK **$ 11,375**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Prepare Draft Report		2	16		20	8		
Attend Workshop			3					
Total Hours	**0**	**2**	**19**	**0**	**20**	**8**	**0**	**0**

Task 1.8
Present Draft Phase 1 Report to County Executive and County Council

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ 5,000	L/S		$ 5,000
Project Manager	$ 206	Hrs.	3	$ 618		Sub: A. Goldsmith LLC	$ -	L/S		$ -
Senior Engineer	$ 185	Hrs.	10	$ 1,850						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	240	$ 138
Staff Engineer	$ 109	Hrs.	4	$ 436		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 2,904**				**Direct Expenses**		**$ 138**
								Subconsultant expenses		$ 5,000
TOTAL TASK				**$ 8,042**						

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Prepare Draft Presentation		1	4		4			
Meeting with Steering Committee			2					
Meeting with County Executive		2	2					
Meeting with County Council			2					
Total Hours	**0**	**3**	**10**	**0**	**4**	**0**	**0**	**0**

Task 1.9
Finalize Phase 1 Report

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ 3,500	L/S		$ 3,500
Project Manager	$ 206	Hrs.	2	$ 412		Sub: A. Goldsmith LLC	$ 800	L/S		$ 800
Senior Engineer	$ 185	Hrs.	24	$ 4,440						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	160	$ 92
Staff Engineer	$ 109	Hrs.	40	$ 4,360		Reproduction	$ 0.08	page	100	$ 8
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S	1	$ 50
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 9,212**				**Direct Expenses**		**$ 150**
								Subconsultant expenses		$ 4,300

TOTAL TASK **$ 13,662**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Address Comments		2	16		20			
Finalize Report			8		20			
Total Hours	**0**	**2**	**24**	**0**	**40**	**0**	**0**	**0**

Contingency:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech	Fee
Address County Council Comments			20						$ 3,700

Task 2.1
Technology Screening and Feedstock Specification

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ -	L/S		$ -
Project Manager	$ 206	Hrs.	2	$ 412		Sub: A. Goldsmith LLC	$ -	L/S		$ -
Senior Engineer	$ 185	Hrs.	6	$ 1,110						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile		$ -
Staff Engineer	$ 109	Hrs.	16	$ 1,744		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 3,266**				**Direct Expenses**		**$ -**
								Subconsultant expenses		$ -
TOTAL TASK				**$ 3,266**						

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Screen Technologies		1	4		8			
Develop Feedstock Specifications		1	2		8			
Total Hours	**0**	**2**	**6**	**0**	**16**	**0**	**0**	**0**

Task 2.2
Scoping Four-Season Waste Sort

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ -	L/S		$ -
Project Manager	$ 206	Hrs.	1	$ 206		Sub: A. Goldsmith LLC	$ -	L/S		$ -
Senior Engineer	$ 185	Hrs.	4	$ 740						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile		$ -
Staff Engineer	$ 109	Hrs.	8	$ 872		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 1,818**				**Direct Expenses**		**$ -**
								Subconsultant expenses		$ -
TOTAL TASK				**$ 1,818**						

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Develop Waste Sorting Program		1	4		8			
Total Hours	**0**	**1**	**4**	**0**	**8**	**0**	**0**	**0**

Task 2.3
Financial Modeling and Detailed Analysis

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ -	L/S		$ -
Project Manager	$ 206	Hrs.	50	$ 10,300		Sub: A. Goldsmith LLC	$ 2,000	L/S		$ 2,000
Senior Engineer	$ 185	Hrs.	8	$ 1,480						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile		$ -
Staff Engineer	$ 109	Hrs.	76	$ 8,284		Reproduction	$ 0.08	page	200	$ 16
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 20,064**				**Direct Expenses**		**$ 16**
								Subconsultant expenses		$ 2,000

TOTAL TASK **$ 22,080**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Financial Modeling		50			60			
Detailed Analysis			8		16			
Total Hours	**0**	**50**	**8**	**0**	**76**	**0**	**0**	**0**

Task 2.4
Draft Phase 2 Report

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ -	L/S		$ -
Project Manager	$ 206	Hrs.	2	$ 412		Sub: A. Goldsmith LLC	$ 1,200	L/S		$ 1,200
Senior Engineer	$ 185	Hrs.	18	$ 3,330						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	80	$ 46
Staff Engineer	$ 109	Hrs.	24	$ 2,616		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	8	$ 464		Shipping	$ 50	L/S	1	$ 50
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 6,822**				**Direct Expenses**		**$ 96**
								Subconsultant expenses		$ 1,200

TOTAL TASK **$ 8,118**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Prepare Draft Report		2	16		24	8		
Meeting with Steering Committee			2					
Total Hours	**0**	**2**	**18**	**0**	**24**	**8**	**0**	**0**

Task 2.5
Present Draft Phase 2 Report to County Executive and County Council

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ -	L/S		$ -
Project Manager	$ 206	Hrs.	2	$ 412		Sub: A. Goldsmith LLC	$ -	L/S		$ -
Senior Engineer	$ 185	Hrs.	8	$ 1,480						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile	160	$ 92
Staff Engineer	$ 109	Hrs.	8	$ 872		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 2,764**				**Direct Expenses**		**$ 92**
								Subconsultant expenses		$ -

TOTAL TASK **$ 2,856**

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Prepare Draft Presentation			4		8			
Meeting with County Executive		2	2					
Meeting with County Council			2					
Total Hours	**0**	**2**	**8**	**0**	**8**	**0**	**0**	**0**

Task 2.6
Final Report

Solid Waste Management Options Study
Frederick County, Maryland
Northeast Maryland Waste Disposal Authority

Cost Breakdown:

Labor	Rate	Units	Hours	Fee		Expenses	Rate	Units	Quantity	Fee
Principal	$ 224	Hrs.	0	$ -		Sub: Nexight Group	$ -	L/S		$ -
Project Manager	$ 206	Hrs.	0	$ -		Sub: A. Goldsmith LLC	$ -	L/S		$ -
Senior Engineer	$ 185	Hrs.	16	$ 2,960						
Project Engineer	$ 164	Hrs.	0	$ -		Mileage	$ 0.575	mile		$ -
Staff Engineer	$ 109	Hrs.	28	$ 3,052		Reproduction	$ 0.08	page		$ -
Clerical	$ 58	Hrs.	0	$ -		Shipping	$ 50	L/S		$ -
Senior Technician	$ 83	Hrs.	0	$ -						
Field Technician	$ 62	Hrs.	0	$ -						
Total Direct Labor				**$ 6,012**				**Direct Expenses**		**$ -**
								Subconsultant expenses		$ -
TOTAL TASK				**$ 6,012**						

Labor Breakdown:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech
Address Comments			8		16			
Finalize Report			8		12			
Total Hours	**0**	**0**	**16**	**0**	**28**	**0**	**0**	**0**

Contingency:

Subtasks	Prn.	Proj Mgr	Sr. Eng	Proj. Eng.	Staff	Clerical	Sr Tech	Field Tech	Fee
Address County Council Comments			20						$ 3,700
Prepare for and Attend Council Meetings			15						$ 2,775

APPENDIX B

RESUMES

Jeremy W.F. Morris, Ph.D., P.E.

Geosyntec consultants

Profession

Civil and Environmental Engineer

Positions

Geosyntec Consultants
Senior Engineer, 2008-present
Project Engineer, 2003-08
Engineer, 2001-03

School of Civil and Env. Eng., Univ. of the Witwatersrand, Johannesburg, South Africa

Expert Consultant, 1999-2000
Research Assistant, 1996-2000

Centre for Environmental Control and Waste Management, Imperial College London, United Kingdom

Laboratory Assistant, 1994

Education

Ph.D., Civil Engineering, Univ. of the Witwatersrand, Johannesburg, S. Africa, 2001

M.Sc., D.I.C. Environmental Eng., Imperial College, London, 1995

B.Eng., Civil Engineering, Imperial College, London, 1993

CAREER SUMMARY

Jeremy Morris, a Senior Engineer with Geosyntec, has over 16 years' experience in environmental engineering and solid waste management. His Ph.D. research work involved investigation of anaerobic degradation processes, landfill hydrological properties, pollution potential, and time to stabilization. A regular participant at technical symposia, he is actively engaged in teaching and speaking at meetings and workshops for regulatory and profession associations. With Geosyntec, he has served as lead investigator on several U.S. EPA research studies and has served important technical roles on dozens of national and international solid waste projects for both private and public clients. He is a nationally recognized leader in the fields of sustainable landfill management and post-closure care and has extensive experience with beneficial redevelopment of former landfills and brownfield sites as platforms for renewable energy (solar, wind, gas-to-energy, and geothermal). Dr Morris also has comprehensive experience with performance of feasibility studies for solid waste project development, including market valuations, cost estimating, and cash flow analyses.

Selected Relevant Experience:

Research Studies and Guidance Manuals

Guidance Manual for Engineering Uses of Scrap Tires (Maryland Department of the Environment, Maryland Environmental Service, 2008)

Permitting of Landfill Bioreactor Operations: Ten Years after the RD&D Rule (USEPA Office of Research & Development, 2014)

Causes and Mitigation of Elevated Subsurface Temperatures in Solid Waste Landfills (USEPA Office of Research & Development, 2014)

Performance-Based Approach to Ending Post-Closure Care at MSW Landfills (Environmental Research and Education Foundation, 2006 and 2011)

Alternative Waste Technologies and Renewable Energy

Feasibility Study and Conceptual Design for Renewable Energy Park at Lorton Landfill (EnviroSolutions, Virginia, 2011-2014)

Feasibility Study and Conceptual Design for Landfill-Based Geothermal Heat Exchange System (Republic Services, Inc., Virginia 2013)

Feasibility Study for Solar Energy Development, Statesville Landfill (City of Charlotte, North Carolina, 2013)

Geosyntec consultants

Professional Memberships

International Solid Waste Association

International Waste Working Group

IWWG Task Group on Sustainable Landfill Management

Solid Waste Association of North America

Interstate Technical and Regulatory Council

City and Guilds Institute, London

Publications

Author of over 45 technical papers

Google Scholar: http://scholar.google.com/citations?user=3ZXE_2AAAAAJ

Feasibility Study for Landfill Gas to bioCNG Project (City of Flagstaff, Arizona, 2012-2013)

Feasibility Study for Exposed Geomembrane Solar Caps for Coal Ash Management Facilities (NRG, formerly GenOn, Maryland, 2012)

Negotiation for Cashless Third-Party Gas-to-Energy Project Development Leveraging Methane Emission Offsets Credits (Dorchester County, Maryland, 2007-2009)

Feasibility Study for Landfill Gas to Energy Project (Wicomico County, Maryland, 2005)

Waste Characterization

Multi-Site Assessment of Waste Calorific Value as Feedstock for Fuel Pelletizing Facilities (Confidential Client, 2012-2013)

Multi-Site Assessment of Recovery of Recyclables and Compostable Organics from Mixed Waste Stream (Waste Management, Inc., 2010-2011)

Waste Characterization Study at Cherry Island Landfill, Wilmington (Delaware Solid Waste Authority, 2003)

Planning and Public Communication

Ten-Year Solid Waste Management Plan (Dorchester County, Maryland, multiple updates 2006-2015)

Comprehensive Update of Waste Handling and Disposal Master Plan (Cecil County, Maryland, 2012-2013)

Market Valuation Study for a Construction & Demolition Debris Facility (Hampton Roads Recovery, Virginia, 2005 and 2012)

Environmental Protection at the Managed Solid Waste Landfill (Waste Management, Inc., 2008-2009)

Greenhouse Gas Emissions and Carbon Credits

Methane Emission Offsets Credit Project Registration and Transactions (Wicomico County, Maryland, 2009-2012; Howard County, Maryland, 2008-2009; Town of Amherst, Massachusetts, 2007-2008)

Development of a Greenhouse Gas Baseline Inventory in Compliance with Executive Order 13423 (Denver Federal Center, Colorado, 2008-2009)

Greenhouse Gas Emission Inventory for AB-32 (Orange County Waste and Recycling, California, 2007-2008)

Financial Modeling and Bid Strategy Support for Carbon Credits Project, Bogota, Colombia (Ameresco, Inc., 2006-2007)

Thomas B. Ramsey, P.E.

Geosyntec consultants

Profession

Civil Environmental Engineer

Positions

Geosyntec Consultants, Columbia, Maryland, Associate, 2002-present

Waste Management, Inc., Atlanta, Georgia, Regional Landfill Manager, 1998-2002

USA Waste Services, Inc., Atlanta, Georgia, Regional Engineer, 1991-1998

Duke University, Durham, North Carolina, Research Assistant, 1990-1991

Waste Management or North America, Inc., Wakefield, Massachusetts, Staff Engineer, 1988-1990

Education

M.S., Environmental Eng., Duke University, 1991

B.S., Civil Engineering, Dartmouth College, 1988

B.A., Engineering, Dartmouth College, 1987

Professional Memberships

American Academy of Environmental Engineers

American Society of Civil Engineers

CAREER SUMMARY

Mr. Ramsey has more than 25 years of professional experience with the planning and development many types of solid waste facilities, including landfills, transfer stations, material recovery facilities (MRFs) and truck maintenance facilities. He has managed numerous landfill operations and capital projects, which has provided him with an in-depth knowledge and first-hand experience with the impacts of site characteristics and waste collection and handling constraints on economic and operational performance.

Selected Experience: Landfill Operations

Mr. Ramsey served as a Region Landfill Manager for over 20 landfills encompassing a territory including Alabama, Georgia, northern Florida, and North and South Carolina which collectively managed over 8 million tons of waste annually. His responsibilities included procurement and maintenance of heavy equipment fleet, regular review of staffing and operating expenses, and annual budgeting for revenues, expenses, and major construction projects.

Selected Experience: Economics of Waste Processing Technologies

Mr. Ramsey is experienced in the assessment of economic factors influencing viability of waste processing and disposal technologies including landfilling, composting, MRFs, liquids solidification, bioreactors, landfill mining, and long-haul disposal. He compares and contrasts capital and operational costs, reliability, and ability to permit particular technologies versus competing traditional methods and technologies within the marketplace.

Infrastructure Review and Capital Budgeting for Two Waste Processing Facilities in Western Virginia (2012): Work included review of existing 20-year-old infrastructure to identify needed repairs and their urgency, performance of operational review and advice on improving operations, and preparation of engineering cost estimates for capital planning.

Selected Experience: Strategic Planning and Optimization of Field Operations

Mr. Ramsey reviews facility operations and design to identify efficiencies and reduce operating costs. Common operational economics typically include heavy equipment maintenance, construction budgeting and planning, staffing, use of alternative

Geosyntec consultants

Solid Waste Association of North America (SWANA), mid-Atlantic Chapter

Selected Publications

Espinoza, R.D, Germain, A.M., Kocenko, L.B., Ramsey, T.B., "Design and Construction Considerations for a Vertical Landfill Expansion over Extremely Compressible Soils" *WasteCon,* Boston, MA, 2010

Ramsey, T.B, Gaffigan, W.J., "Where Does All the Garbage Go? Basic Landfill Economics Driving Waste Flow in Private Industry" *Proceedings of the SWANA's Eighth Annual Landfill Symposium and Solid Waste Managers*, Atlantic City, NJ, 2003

Othman, Majdi, Beech, J.F, Ramsey, T.B., "Preliminary Results of Blast Densification Pilot Program," *Geotechnical News*, 1998, Vol. 16, No. 4, pp. 43-47

Vesilind, P.A., Ramsey, T.B., "Effect of Drying Temperature on the Fuel Value of Wastewater Sludge," *Waste Management and Research*, 1995

Ramsey, T.B., Urrutia, J.L., Pearson, R., Karanjac, J., "Comparing Solid Waste Liner System Performance for Liner Variance Applications" *Proceedings of the Ninth International Conference on Solid Waste and Management*, Philadelphia, PA, 1993

technologies, and logistics.

Operations review for the Solid Waste Authority of Central Ohio (2014): Work included as assessment of operations, budgeting, work management and staffing of the Authority's operations including two transfer stations and a 3,000 TPD operating landfill. Provided a prioritized assessment of recommendations to improve operations and reduce costs.

Selected Experience: Waste Facilities Permitting and Development

Mr. Ramsey is experienced in project management and planning, permitting, design, and construction for landfills, transfer stations, material recovery facilities (MRFs), composting facilities, landfills, and trucking maintenance facilities. He performs fatal flaw analyses, addresses compliance and/or regulatory issues, directs engineering design and permitting activities, and prepares cost estimates for financial planning.

Provide Expert Guidance for Selection of a Private Contractor to Develop a landfill Gas Collection System and Beneficial Use Project, Augusta County, Virginia (2011): Project involved review of 13 proposals based on technical and financial criteria, providing guidance on selection of four finalists and giving a final recommendation for a 20-year contract.

Selected Experience: Facility Retrofitting and Improvement

Mr. Ramsey is experienced in the identification of design and/or operational failures in poorly performing facilities. He reviews repair alternatives, prepares work scope and budget, and evaluates post-repair success. In cases of poor operating procedures, he identifies equipment and/or training deficiencies and prepares operating plans to address environmental compliance or safety hazards.

Consulting Support Regarding Responses to Notices of Violation from State Regulators for Poor Landfill Operating Practices, Odor Issues, Excessive Leachate Generation, and a Poorly Operating LFG Collection System at a Landfill In Eastern U.S., Confidential Client (2013): Specific issues included helping the site operator and a third-party LFG operator identify the causes of specific problems and identifying objective and constructive actions to move forward and resolve the issues causing the regulatory enforcement.

Ross Brindle, MBA

NEXIGHT GROUP

Profession

Strategic Planning, Energy and Environmental Analysis, Technical Communications

Positions

Nexight Group LLC

Energetics Incorporated

Biotechnology Institute, Penn State University

Education

MBA, Concentration in Global Strategy, Robert H. Smith School of Business, University of Maryland, 2007

B.S., Chemical Engineering, Honors in Chemical Engineering, Pennsylvania State University, University Scholar's Program, 1997

CAREER SUMMARY

Ross Brindle, co-founder and executive vice president, leads Nexight Group's strategic planning, energy and environmental analysis, and technical communications practices, serving a variety of public- and private-sector clients. During the past 15 years, Mr. Brindle has facilitated more than 250 vision and technology roadmapping workshops, strategic and program planning meetings, industry working groups, and executive seminars on six continents. He is an expert in all phases of the facilitated workshop process and has worked extensively with clients to conceptualize the desired product and outcome and to develop an appropriate workshop design and facilitation approach; his diverse facilitation and roadmapping experience spans dozens of topics in the energy, infrastructure protection, manufacturing, basic science, and global health areas. Through this experience, Mr. Brindle has honed his ability to understand and facilitate highly technical discussions in areas outside his immediate experience, enabling him to serve a wide range of clients, including the National Institute of Standards and Technology (NIST), the Singapore National Climate Change Secretariat, the U.S. Department of Energy (DOE), the Propane Education & Research Council (PERC), the American Society of Mechanical Engineers (ASME), The Metals, Minerals, & Materials Society (TMS), and many other industry groups and trade associations, national laboratories, universities, and individual companies.

Selected Experience: Workshop Facilitation

Facilitated more than 250 vision and technology roadmapping workshops, strategic and program planning meetings, public-private partnership meetings, and executive seminars.

Led a facilitation training course for employees of PATH, an international non-profit organization dedicated to providing solutions that improve global health.

As a result of the Fukushima nuclear accident, worked with the American Society of Mechanical Engineers on an initiative to prevent and mitigate the consequences of complex systems failures. The project engaged more than 35 experts from the public and private sectors in a series of three facilitated workshops, resulting in a report that is guiding ASME's contribution to complex systems management.

Sarah Lichtner

NEXIGHT GROUP

Profession

Technical Writer and Editor

Positions

Nexight Group LLC

Energetics Incorporated

CEPD Psychological Services, Inc.

UMBC Review: Journal of Undergraduate Research

Education

M.A., Writing, Concentration in Science and Medical Writing, Johns Hopkins University, 2013

B.A., English Literature, Minor: Professional Writing (summa cum laude), University of Maryland, Baltimore County, 2008

CAREER SUMMARY

Ms. Lichtner writes and edits technical communication materials, including proposals, fact sheets, reports, case studies, and website content, on a multitude of technical topics, including materials science, manufacturing, energy, climate change, and biological science. Her academic background and professional experience have contributed to her ability to write and edit concise, clear, and accurate documents for clients, including the American Chemistry Council (ACC); American Society of Mechanical Engineers (ASME); ASM International; Department of Primary Industries in Victoria, Australia; Minerals, Metals & Materials Society (TMS); Propane Education & Research Council (PERC); U.S. Department of Energy (DOE); and U.S. Department of Homeland Security (DHS).

Ms. Lichtner is accustomed to communicating complex technical information for non-technical audiences. Her academic background has contributed to her attention to detail, as well as her comprehension and adherence to grammatical and stylistic rules. Ms. Lichtner specializes in organizing and presenting vast amounts of technical information to convey key messages clearly and accurately. She manages large, time-intensive projects with precision and produces polished, well-researched products that communicate and persuade effectively.

Selected Experience: Communications

Published an article in the October/November 2014 issue of Montgomery Magazine on solid waste management in Montgomery County, MD.

Produces award-winning technical communications, including the ACC Plastics and Polymer Composites Technology Roadmap for Automotive Markets (2015), TMS Innovation Impact Report (2013), Electric Power Research Needs for Grid-Scale Storage Applications (2012), and Remote Tank Level Monitoring System Executive Summary (2012).

Led writing of Advancing Thermal Manufacturing: A Technology Roadmap to 2020, which identifies activities for developing and deploying advanced manufacturing technologies across the broad thermal manufacturing community that will significantly increase sustainability and global competitiveness.

Has conducted and synthesized results from hundreds of telephone interviews to gather perspectives from research experts, government, industry, and technology end users.

Abby M. Goldsmith

Profession

Solid Waste Management Planning

Positions

Principal, A Goldsmith Resources, LLC, 2014 - Current

Asst. Vice President, Leidos/SAIC, 2009 - 2014

Senior Director, R.W. Beck, 2003 – 2009

Senior Project Manager, Weston Solutions,1990 - 2003

Recycling Coordinator Monroe County, New York, 1988 - 1990

Junior Associate Monroe The Conservation Foundation, Washington DC

1986 - 1988

Education

M.A., Ecology, University of North Carolina

B.S., Biology, Emory University

CAREER SUMMARY

Ms. Goldsmith assists state and local governments, trade associations, and businesses to reduce and manage solid waste more sustainably. She recommends waste reduction, recycling and solid waste management strategies based on client objectives and an assessment of current practices. Ms. Goldsmith partners with clients to implement selected strategies through changes in operations and policies, procurement or renegotiation of contracts for facilities or monitoring progress.

Ms. Goldsmith currently serves as the co-chair of the Atlanta Recycles Steering Committee and is an Honorary Board Member of the Georgia Recycling Coalition, having served as its founding President. She developed and has conducted training modules on solid waste planning, financing and waste reduction for the Georgia chapter of the Solid Waste Association of North America for the past 20 years and is a frequent presenter at state, regional, and national sustainability, recycling, and solid waste management conferences.

Selected Relevant Experience:

Development of Solid Waste & Materials Management Plans

- Fulton County, Georgia
- Macon-Bibb County, Georgia
- Tennessee Department of Environmental Conservation Georgia Department of Community Affairs
- Dalton-Whitfield Solid Waste Management Authority
- Dougherty County, Georgia
- Camden County, Georgia
- Glynn County, Georgia
- Gordon County, Georgia
- Northeast Georgia Region (Athens-Clarke County, Morgan County, Oglethorpe County, Elbert County, Madison County, and Walton County)

Collection Assessment & Franchising

- Gwinnett County, Georgia
- Albany-Dougherty County, Georgia
- Athens-Clarke County, Georgia
- City of Atlanta, Georgia Waste Characterization
- Multi-Site Assessment of Waste Calorific Value as Feedstock for Fuel Pelletizing Facilities (Confidential Client)
- Multi-Site Assessment of Recovery of Recyclables and Compostable Organics from Mixed Waste Stream (Waste Management, Inc.)

- Waste Characterization Study at Cherry Island Landfill, Wilmington (Delaware Solid Waste Authority)

Financial Analysis & Rate Development

- Gordon County, Georgia
- Dougherty County, Georgia
- Dalton Whitfield Solid Waste Management Authority

Procurement of Solid Waste Management Services & Facilities

- Beaufort County, South Carolina
- Athens-Clarke County, Georgia
- Mecklenburg County, Georgia
- Dougherty County, Georgia

Diversion Technologies & Facilities

- King County, Washington
- Bartow County, Georgia
- Snohomish County, Washington
- Athens-Clarke County, Georgia
- Mecklenburg County, Georgia
- Houston-Galveston Area Council (Texas)
- Winston-Salem Forsyth County Utility Commission

Measuring Waste Reduction & Recycling

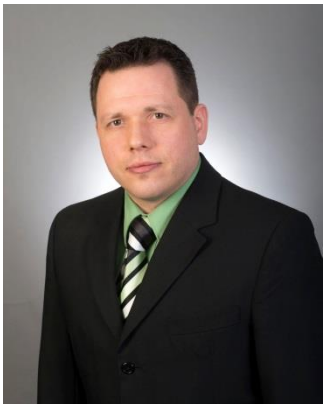
- Georgia Recycling Coalition (Measure Georgia Campaign)
- American Forest and Paper Association
- Houston-Galveston Area Council, Texas
- Fisher College of Business, The Ohio State University
- Athens-Clarke County, Georgia

Waste Characterization Studies & Diversion Strategy Development

- City of Phoenix, Arizona
- Winston-Salem Forsyth County Utility Commission
- King County, Washington
- Beaufort County, South Carolina
- Georgia Department of Natural Resources, Sustainability Division
- Georgia Department of Community Affairs
- Bartow County, Georgia
- Athens-Clarke County, Georgia
- Association of Home Appliance Manufacturers
- Georgia Department of Community Affairs, Source Separated Organics Collection Model and Toolkit

Michael S. Toth II

Geosyntec consultants



Profession

Environmental Engineer

Positions

Geosyntec Consultants, 2014 – present

Waste to Energy Partners, LLC, 2011 – 2013

University of Central Florida, Graduate Research Assistant, 2010 – 2013

Consulting - Inn on Fifth- 87 Room Hotel Sustainability Design, 2010

Bonita Springs Utilities (BSU), Internship - Sustainability Design, 2010

LIS Engineering, Internship Working under Robert Case, 2009

Education

M.S. Environmental Engineering, University of Central Florida, Orlando, Florida, 2012

B.S. Environmental Engineering, Florida Gulf Coast University, Fort Meyers, Florida, 2010

CAREER SUMMARY

Mr. Toth is an environmental engineer experienced in design and evaluation of water/wastewater treatment systems, solid waste management, air pollution prevention and control design, stormwater management design. Expertise includes Life Cycle Assessments (LCAs), renewable energy technology development at landfill sites, solid waste management and waste conversion via technologies (e.g., combustion, pyrolysis, and variants of gasification and Fischer-Tropsch) for production of waste-derived fuels. Performed on-site evaluation and vetting for waste conversion technologies and associated processes and has performed standardized collection and technical evaluation for non-electrical "out" products (e.g., carbon, oil, syn-gas). Conducted ISO 14044-certified LCAs for products (e.g., Crystalline Silicon and Cadmium Telluride photovoltaics), traditional geared and direct-drive wind turbines, landfill gas-to-energy systems, tire-derived carbon, and virgin carbon black utilizing process analysis and economic input/output approach. Prior business experience at waste-to-energy startup company.

Selected Experience: Municipal & Solid Waste Management

Technical Report for Construction and Demolition (C&D) Debris Recovery and Recycling, Orange County, Florida. Developed a model to establish better-defined markets for C&D recyclable materials. Model evaluates current recycling markets and opportunities where increasing the recycling rate of particular C&D materials may be economically beneficial. Tied model to construction permits from six market sectors over 10-year period to estimate distribution of waste stream components.

Feasibility Study for Bonita Springs Utilities Solar Array, Bonita Springs, Florida. Evaluated potential development of vacant land with photovoltaic solar panels. Identified favorable siting locations, evaluated resource potential, located potential transmission and distribution lines, evaluated financial outlook.

Technical Report for Multi-Level Decision Tool for Converting Landfills into Sustainable Energy Parks. Created comprehensive decision tool to aid in selection of best alternative energy technologies to convert closed landfill sites into energy parks. Decision tool includes screening for favorable site and climatological conditions and further optimization of technology at candidate landfill sites by conducting detailed technical, economic, and cradle-to-grave life cycle assessment. Explored renewable energy technologies: landfill gas-to-energy, wind turbines, photovoltaics, and energy crops.

William Gaffigan, MBA, CVA

Geosyntec consultants

Profession

Economist

Financial, Technical Due Diligence Advisor

Positions

Geosyntec Consultants, Columbia, Maryland, 2013-present

Galiant Group, Inc., Atlanta, Georgia 2001-2013

Vivebio, LLC, Atlanta, Georgia 2009-2010 (Interim COO in Biotech startup)

CS, Inc. Ft. Lauderdale, Florida 1999-2000

USA Waste / Waste Management (and predecessor companies) 1990 - 1998

Education

MBA, Finance, West Virginia University, West Virginia, 1984

B.A., Economics, Indiana University of Pennsylvania, Pennsylvania, 1982

Professional Memberships

National Association of Valuation Analysts

Solid Waste Association of North America

CAREER SUMMARY

Mr. Gaffigan has more than 25 years of experience in solid waste as an executive and advisor, with specialized capabilities in financial analysis, valuation, business transactions, and strategic business consulting. He has been qualified as an expert witness in valuation and solid waste matters and has provided testimony in state, federal tax, and bankruptcy courts as well as in arbitration and mediation settings.

Mr. Gaffigan has valued hundreds of companies, facilities and sites across a range of industries. Nationally, he is one of the few certified valuation professionals with extensive experience in multiple segments of the environmental industry.

Mr. Gaffigan has gained transaction experience through the successful closing of more than 60 middle market transactions ranging from $500,000 to $100 million in size, most involved solid waste assets. This included the full range of activities necessary for successful transactions, including prospecting, negotiations, letters of intent, development of transaction documents; close and post close matters, working alongside attorneys, engineers and operations management. He also helped clients raise hundreds of millions of dollars in capital for acquisitions and development. Clients include equity investors, banks, attorneys, solid waste authorities, Fortune 1000 and entrepreneurs.

Selected Experience: Financial Advisory

Financial Advisory, Solid Waste Authority of Central Ohio: Provided advisory services encompassing operations analysis, financial analysis and policy recommendations to improve the performance of an integrated waste transfer, disposal and recycling system which handles approximately 1 million tons a year. Subsequently engaged to develop long-term planning and benchmarking frameworks.

Financial Advisory, Valuation, Confidential Client: Provided valuation advisory services to support the refinancing of a large solid waste recycling and transfer facility. Conducted market study, financial analysis, and formal valuation to develop a conclusion of value on the asset. The conclusion was used to support financing decision by bank.

Financial Advisory Project, Confidential Client: Provided financial and management consulting concerning operation, development and financing of a 1,500-acre landfill with a 5,000 tpd permit.

Geosyntec consultants

Selected Publications

Baraschick, N., Gaffigan, W.J. , "Recession, Recovery, Recycling and Reconsidering the Economics of your Sold Waste System" *Proceedings of the SWANA's Georgia Chapter Fall Conference*, Augusta, GA, 2014

"Financial and Sustainability Reporting", Co-presenter for a webinar with American Electric Power (AEP), National Association for Environmental Health and Safety Management (NAEM), 2014

"When is an Entity Solvent", presentation to Georgia Chapter of National Association of Certified Financial Analysts, Atlanta, GA, 2010

Ramsey, T.B, Gaffigan, W.J., "Where Does All the Garbage Go? Basic Landfill Economics Driving Waste Flow in Private Industry" *Proceedings of the SWANA's Eighth Annual Landfill Symposium and Solid Waste Managers*, Atlantic City, NJ, 2003

Financial Advisory, Confidential Client: Provided financial modeling of scenarios concerning investment in dewatering equipment to reduce waste disposal costs.

Financial Advisory, Watershed Geosynthetics: Provided advisory services to a manufacturer of engineered products. Advisory encompassed financial modeling of relative landfill closure cost comparing traditional techniques and their alternative closure products, provided guidance on impact of financial closure surety and regulations on product adoption, and analysis of integration of solar power into their business model.

Selected Experience: Due Diligence

Due Diligence, Confidential Client: Determined financial feasibility of acquiring landfill for private investor. Required evaluation of investment value and creation of operating and develop plans for a landfill system which included hauling, transfer stations and rail components.

Due Diligence, Confidential Client: Determined feasibility of developing a solid waste transfer station for sale or lease. Project components included market and financial analysis.

Selected Experience: Infrastructure Development

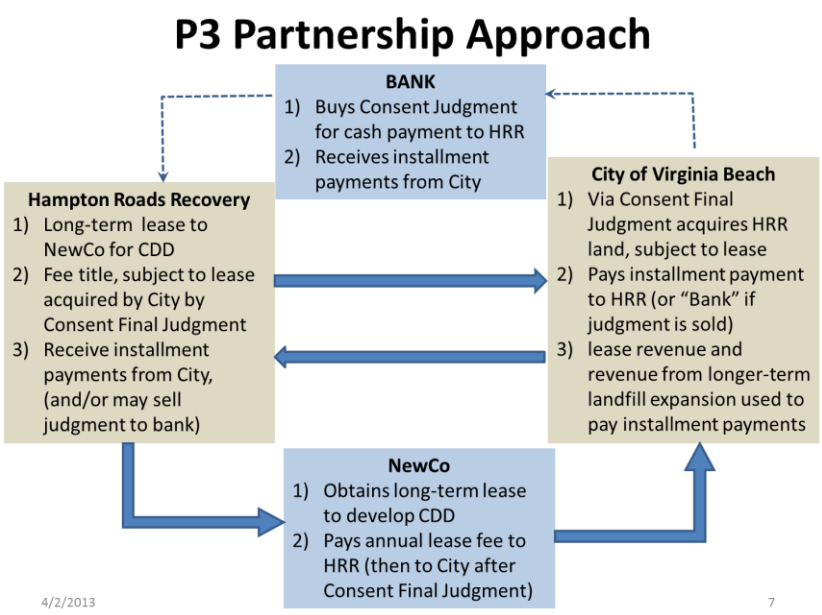
Infrastructure Development, Public Private Partnership, Southeastern U.S.: Worked closely with government officials and private solid waste management company to acquire property and develop a solid waste disposal facility. Specific work components were feasibility study, development of area solid waste plan, and permitting activities.

APPENDIX C

REPRESENTATIVE EXPERIENCE

Geosyntec consultants

Market and Infrastructure Investment Valuation,
Public Private Partnership
Hampton Reads Recovery Center
Virginia Beach, Virginia



Client: Hampton Roads Recovery Center, Inc.

Services Provided:

- ✓ Market survey
- ✓ Infrastructure Investment Valuation
- ✓ P3 Modeling and Negotiation Support
- ✓ Valuation using DNPV and stochastic modeling of the operating landfill cash flows
- ✓ Revenue optimization using state-of-the-art engineering techniques
- ✓ Design and permitting

Project Objective

Hampton Roads Recovery Center, Inc. (HRRC) was considering investing in an 80-acre real estate parcel with the purpose of designing and permitting a construction and demolition debris (CDD) disposal landfill facility in the City of Virginia Beach. Because the project would involve developing a landfill facility on a relatively small footprint, HRRC sought an innovative design to maximize the disposal capacity and hence their financial results. HRRC retained Geosyntec to develop an optimal design upon which to value their future landfill operation.

Geosyntec's Scope of Services

Geosyntec's valuation services in of support the financial transaction for the facility included a market survey of competing facilities in the vicinity of the proposed location (based on waste type, tonnage, available remaining capacity, and tipping fees) as well as a construction cost estimate for the optimal landfill design. We developed a projected cash flow analysis, estimated the net present value (NPV) using standard financial analysis, and performed a deterministic and stochastic market valuation using Crystal Ball. Based on Geosyntec's valuation report, HRRC was able to secure a $15 million loan to develop the CDD landfill.

Subsequently, because of the landfill's direct proximity to the City's municipal solid waste (MSW) landfill, which was nearly out of capacity, the City became interested in acquiring the property to expand their MSW landfill operation. Geosyntec prepared a financial model for a friendly condemnation proceeding for HRRC's facility. The proposed acquisition would be performed via a private public partnership (P3) arrangement consisting of the City acquiring the facility subject to a 20-year ground lease and receiving payments from a new special purpose entity established to operate the facility. Geosyntec also performed a post-operational valuation of the facility to facilitate ongoing negotiations between the City and HRRC for a cashless acquisition of the facility under a P3. To this end, Geosyntec used a state of the art valuation methodology named decoupled net present value (DNPV). The DNPV method allows direct integration of technical due diligence into a project valuation.

Notable Accomplishments

Geosyntec combined its financial insight with its landfill design expertise to provide a design that resulted in a net 60% increase in disposal volume over a more conventional design at little additional construction cost, significantly enhancing HRRC's leverage in securing loans and its negotiating position with the City.

Geosyntec applied its first-hand knowledge of operations, planning, and financial oversight at large landfills and transfer stations to reduce SWACO's operating costs.

Client: Solid Waste Authority of Central Ohio

Services Provided:

- ✓ Capital planning review
- ✓ Financial analysis
- ✓ Operations review
- ✓ Organizational review

Project Objective

The Solid Waste Authority of Central Ohio (SWACO) manages over a million tons of solid waste annually through an integrated regional network of waste processing, transfer, and disposal facilities in the Columbus, Ohio region. Following a major turnover in executive management, SWACO was interested in a top-to-bottom review of their organization so that they could assure their stakeholders that the organization could continue its mission well into the future. In support of this goal, SWACO retained Geosyntec to provide an independent assessment of their solid waste operations, financial planning, staff organization and maintenance operations. This included a review of their landfill and transfer station operations, landfill gas (LFG) system operations, heavy equipment maintenance, capital projects planning, financial reporting, in-house engineering support, and overall organization of their operations.

Geosyntec's Scope of Services

Geosyntec conducted a records review and on-site review and assessment, including personnel interviews and surveys, of SWACO's operations. Facilities reviewed included SWACO's operating and closed landfills, LFG systems at both landfills, and two transfer stations. Issues of focus included: landfill and transfer station operational procedures, landfill gas collection system operation, equipment procurement and maintenance, personnel organization, financial planning, financial reporting, and capital projects procedures. To execute the work, Geosyntec brought in a team of senior professionals with decades of experience in all of the review areas. Based on our extensive experience with landfill finances and operations, as this work was completed, we were able to quickly gain a high-level understanding of the organization, identifying both strengths and weaknesses of operational and financial practices and procedures versus typical industry standards and benchmarks. With this information, we made several presentations to SWACO management to help them identify a plan and schedule for implementing changes to their organizational structure, overhauling budgeting procedures and cash flow tracking systems, and improving data collection and management systems. We also provided SWACO with a revised capital planning model and risk management approach.

Notable Accomplishments

Geosyntec's review was used by our client to effectively gain an understanding of where their operations were generally well-run as well as identify areas where improvements could be made. The experience and understanding of our professionals with "real-world" solid waste operations and financing allowed Geosyntec to develop prioritized, actionable recommendations to our client for improving operational efficiency and long-term planning with the ultimate goal of achieving an optimized operation that will remain strong well into the future.

Geosyntec provided operational review services, identifying potential inefficiencies and value to our client for their solid-waste-related acquisition.

Client: Confidential

Services Provided:

- ✓ Waste processing facility operations review
- ✓ Future capital expenditure estimation
- ✓ Acquisition due diligence support

Project Objective

Our confidential client is a major private of solid waste management service provider in the United States. To fuel growth within their industry, our client regularly pursues acquisition companies as candidates to enter new markets, vertically integrate operations within existing markets, and establish economies of scale within their own operations in order to remain competitive within the marketplace. Typical waste processing facilities include transfer stations and material recovery facilities. Recognizing that typical "fill in the blank" site assessment services would offer little value to identifying the true value of their acquisition, Geosyntec has been retained on several occasions to review existing operations and identify major technical and operational issues that should be reviewed if the acquisition is completed.

Geosyntec's Scope of Services

Geosyntec has provided a variety of services related to solid-waste operations and future capital expenditure review. These services are commonly performed as part of acquisition due diligence, subject to the confidentiality and strict deadlines required for successful completion of these projects. Representative tasks include:

- Comparison of existing design and operational practices with best-practices;
- Identifying operational problems that require trouble-shooting;
- Reviewing the condition of existing facilities and equipment, making recommendations regarding the timing and cost associated with repairs or replacement; and
- Review of permit and regulatory issues which may have major impacts on future business operations

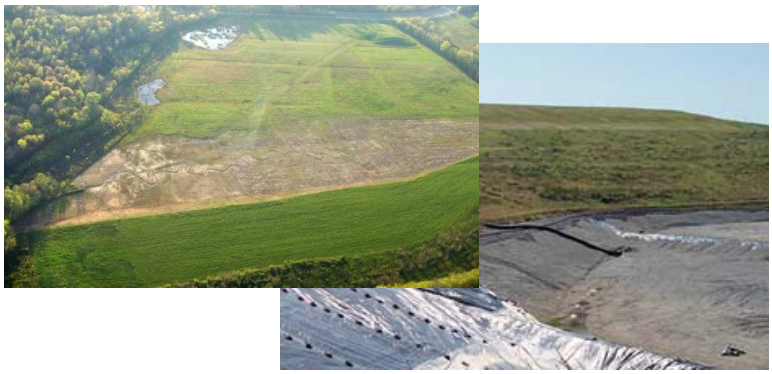
The purpose of this work is to identify potentially major issues that could result in financial improvement or prevent an unplanned major expense should the acquisition be completed. Key to this work is a basic understanding of the complexities and limitations associated with labor and equipment intensive functions, such as the processing of solid waste or source-separated recyclables for the recovery of valuable materials. Often, lessons to be learned and/or difficulties can only be identified after a review of operations and knowledgeable discussions with operations personnel. Geosyntec's depth of experience in the solid waste industry provide insight into the details of design and operations and how they impact the overall operation of a facility.

Notable Accomplishments

Geosyntec played a key role in providing operations review and assistance to our client, demonstrating its depth and flexibility to provide senior level professionals with a range of technical and operational expertise on a time-critical acquisition project. This expertise helped to identify hidden risks as well as hidden value to our client in their solid-waste-related acquisition.

Geosyntec consultants

Landfill System
Cost of Services
Dalton County, Georgia



Geosyntec provided guidance to our client to develop a 2014 budget.

Client: Dalton Whitfield Solid Waste Authority

Services Provided:

- ✓ Financial analysis for development of annual budget
- ✓ Cost of services for landfill, MRF and other operating components
- ✓ Market and disposal fee pricing study
- ✓ Analysis of flow control related issues
- ✓ Analysis of closure and post closure reserves

Project Objective

In 2013, the Dalton Whitfield Solid Waste Authority (DWSWA) in Dalton County, Georgia, engaged Geosyntec to provide financial analysis and strategic consulting related to their annual budgeting and planning cycle. DWRSWA has a highly integrated solid waste infrastructure that operates within a waste flow control environment. They own and operate a MSW landfill, an industrial landfill, a materials recovery facility, a commercial landfill gas-to-energy project, waste convenience/transfer facilities, and a county-wide recycling program. As with other municipal entities, they were encountering challenges as well as new opportunities due to the dynamics of the economy, increased demand for services, increased recycling, and an orientation toward efficiency.

Geosyntec's Scope of Services

Geosyntec was engaged to provide analysis on the multiple components of the DWRSWA integrated system with a goal of completing their annual budget cycle and making disposal price determinations. In addition, we provided strategic consulting and worked with the Authority on a range of issues. Analysis was done for each revenue and expense line item. We analyzed trends and finer details related to such items as volumes and equipment maintenance. Multiple reports were prepared and multiple presentations were made to the Solid Waste Authority Board.

Notable Accomplishments

Geosyntec's expertise in analyzing integrated waste systems provided perspective and a factual basis for completing the project.

- Supported completion of 2014 budget in a timely fashion
- Identified long-term financial trends
- Made recommendations on changes to fee structure, revenue enhancement and cost reductions
- Provided revised calculations of long-term reserve requirements
- Acted as a sounding board for issues providing perspective with our financial expertise and experience working with and for private companies in the waste industry.

Geosyntec provides guidance to private landfill owner

Client: Green Mountain Management – Flat Top Landfill

Services Provided:

- ✓ Long-term Planning and Valuation Services
- ✓ Benchmarking Performance
- ✓ Modelling Landfill Expenses and Capital
- ✓ Provide Strategic Consulting

Project Objective

The Owner of the Green Mountain Management Flat Top landfill (GMM) in Jefferson County, Alabama, has engaged Geosyntec for projects, led by Bill Gaffigan, on multiple occasions to provide financial analysis, strategic consulting, and valuation services. GMM is the largest private landfill in the Birmingham MSA. It sits on 1,500 acres and has a permit to receive up to 5,000 ton per day.

Geosyntec's Scope of Services

Geosyntec was engaged to do a valuation of the landfill as well as to do strategic consulting surrounding financing, management issues, waste to energy projects and capital projects. The valuation entailed site visits, and discussions with owners and employees. Projects required a detailed analysis of revenue, costs, and capital for a long term planning period that extended beyond 10 years. The detailed inputs included tonnage by waste stream by source, and an assessment of wages and salaries by individual employee based on landfill volumes and other conditions. In addition, it was necessary to model equipment operating and replacement costs for each piece of operating and construction equipment. The assignment also required development of a model of cell and closure construction which included waste compaction and volume received as well as cell design to project the timing of capital construction expenditures. Strategic consulting has been requested and provided on multiple topics based on our direct industry experience.

Notable Accomplishments

Geosyntec's expertise in analyzing integrated waste systems provided perspective and a factual basis for completing the project.

- Have created models to benchmark performance of landfill
- Supported the sourcing of financing options during the development of the landfill.
- Identified long term financial trends
- Provided recommendations on pursuing or disengaging from potential strategic alliances.

Geosyntec designed a conveyor system to reduce material handling, improve safety, and reduce labor cost.

Client: Confidential

Services Provided:

- ✓ Process engineering and optimization
- ✓ MRF design

Project Objective

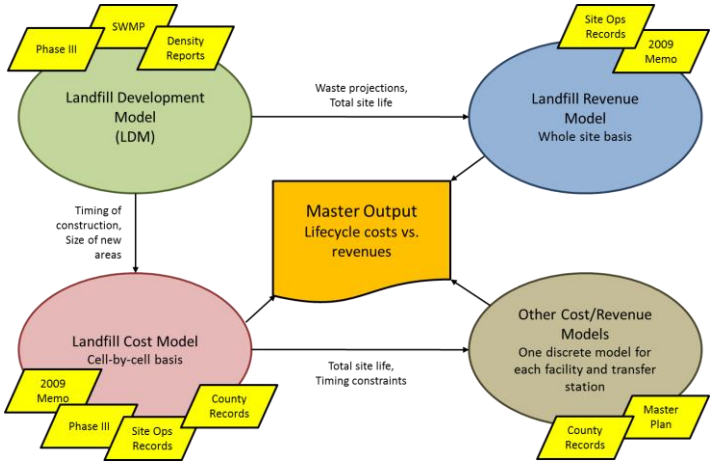
A novel materials recovery facility located at a major airport was experiencing operational issues with its off-the-shelf materials handling and sorting equipment. For example, the installed equipment to open bags was oversized and crushing and mixing the recyclables, lowering the value of the paper based recyclables and rendering some content unrecyclable. Manual operations to take the place of the automated equipment resulted in higher than budgeted labor costs. Geosyntec was retained by the Client and the Airport Authority to evaluate the process, the equipment, and to redesign its operation and flow.

Geosyntec's Scope of Services

Geosyntec evaluated the current operation and identified the points in the process that led to reduced recyclable quality, increased processing times, or required excessive labor. For example, Geosyntec identified that the amount of touches per quantity of material was excessive, dangerous, and time-consuming. Geosyntec also evaluated commercial equipment and determined that off-the-shelf options were either cost-prohibitive or would not adequately address the Client's needs.

Notable Accomplishments

Geosyntec made recommendations and designed an additional conveyor system to reduce material handling, reduce the possibility of injury, and remove and sort materials from the process stream to better match the make-up of the incoming refuse stream. Geosyntec also designed a novel bag opening system to further streamline the process, making it safer and reducing labor cost. A small scale pilot of the full scale system is being implemented to allow for the optimization of the bag opening and conveying systems.



Geosyntec developed an interactive, easy-to-use lifecycle planning tool to enable Cecil County to assess long-term development of solid waste facilities

Client: Cecil County Department of Public Works

Services Provided:

- ✓ Master plan revision and update
- ✓ Development of interactive planning tool
- ✓ Training manual
- ✓ Public communication materials

Project Objective

Geosyntec was retained by Cecil County to provide guidance on optimal implementation of the County's 2008-2017 Solid Waste Management Plan (SWMP). The SWMP calls for future development of alternative solid waste management facilities and waste diversion as well as increasing disposal capacity at the landfill. The County needed to assess several hard-to-predict factors potentially affecting long-term development of the facility, including demographics (e.g., quantities and types of waste generated in the facility's wasteshed), economics (e.g., markets for secondary materials and renewable energy), and policy (e.g., mandates for diversion of organics and recyclables). At the time, Senate Bill 799 had been proposed in the 2013 Maryland legislative session; this would phase in restrictions on the disposal of "unprocessed" waste to landfill and require recycling diversion rates of up to 50%.

Geosyntec's Scope of Services

Geosyntec developed an interactive lifecycle assessment planning tool to evaluate lifecycle effects on costs and revenues associated with developing the facility over a 50-year period. Built on a user-friendly MS Excel® Visual Basic platform, the planning tool allows interactive comparison between different facility development scenarios and predicts future cash flows associated with modifying certain sequences of landfill disposal capacity, installation of waste processing and materials recovery facilities, and other waste acceptance and operational factors. The tool comprises several modules, including a Landfill Development Model (LDM), Facility Revenue Model (FRM), and Facility Cost Model (FCM). The LDM predicts the timing of new landfill cell construction and the total service life of the landfill. The model allows users to change key input parameters (e.g., annual waste intake and growth rate, waste composition and diversion rates, and airspace consumption factor) and provides graphical output depicting necessary site development milestones. The modeled timing of cell development and waste placement serves as primary input control to the FCM and FRM and establishes their boundary conditions. Costs in the FCM (construction, operation and maintenance, administration, financing and bonding, post-closure care, and/or decommissioning) are computed based on this timeline. The FRM includes a comprehensive approach to estimating waste tipping fees and potential revenues from secondary material or renewable energy sales based on market projections and waste compositions.

Notable Accomplishments

Geosyntec's tool provides a cash flow sensitivity analysis to ensure that revenues will be sufficient over the facility lifetime. The tool provides the County with a timeline and anticipated costs for major Capital Investment Project (CIP) events, allowing timely forecasting of major capital outlays. Based on this, the County can establish contingencies for waste handling, disposal capacity, and financial measures. In the latter regard, the County can reduce bonding by optimizing the timing of construction events, in particular closure construction of completed landfill cells.

Geosyntec performed an in-depth market analysis to help the City identify alternatives to simply accepting a major disposal rate increase imposed by a third-party.

Client: City of St. Augustine

Services Provided:

- ✓ Feasibility study
- ✓ Transfer station conceptual design
- ✓ Cost/benefit analysis
- ✓ Pro-forma analysis

Project Objective

The City of St. Augustine, under the Solid Waste Division of the Department of Public Works, is responsible for collecting residential and commercial solid waste generated within the City limits for disposal. The City generates approximately 17,800 tons of solid waste per year from residential and commercial collection routes. The collected waste is transported by the City to one of the two transfer stations owned and operated by St. Johns County, Florida for disposal. The City currently pays the County a tipping (disposal) fee per ton of waste delivered to the transfer station. Upon notice that the County intended to increase this fee by 29 percent, the City determined that it was necessary to explore other available solid waste disposal options. Geosyntec was retained in 2011 to prepare a white paper on available solid waste disposal options.

Geosyntec's Scope of Services

As part of the project, Geosyntec performed a cost-benefit analysis for a number of disposal alternatives, including direct haul, diversion of waste to a different transfer station, and development and operation of a City-owned transfer station. To assess these options, Geosyntec obtained tipping fees and routing requirements for landfills and transfer stations in the region surrounding the City limits. With this information, we performed a pro forma analysis to review the economics of each option. Our analysis included an evaluation of transfer station considerations such as potential sites, permitting requirements, design considerations, capital and operational costs, and use of a direct haul option to dispose the City's solid waste to a nearby landfill facility. The results from our study indicated that if the City could obtain additional solid waste from commercial sources and other municipalities in close proximity to the City, the City-owned transfer station could provide significant savings over current tipping fees. Geosyntec is currently assisting the City in negotiating for these other sources of waste. Geosyntec also helped the City with negotiations with a nearby landfill facility for a lower tipping fee to allow disposal of the City's solid waste. We also recommended that the City should initiate the zoning and permitting process as soon as possible to expedite the project.

Notable Accomplishments

Geosyntec performed an in-depth market analysis to help the City identify alternatives to simply accepting a major disposal rate increase imposed by a third-party. Our analysis also included a roadmap for our client to help them understand and plan for the required contracting issues, design and permitting requirements, construction and operations requirements, as well as schedule necessary to pursue this project. Once implemented, the plan will result in significant savings for the City's solid waste operations for many years to come.

Geosyntec provided a cost-effective field analysis of waste composition to help our client determine the feasibility of materials recovery.

Client: Waste Management, Inc.

Services Provided:

- ✓ Waste composition analysis
- ✓ Economics of waste processing
- ✓ Waste recycling analysis
- ✓ Feasibility of organics recovery

Project Objective

Geosyntec provides a wide range of technical services associated with determining the feasibility of emerging technologies, including field studies, literature reviews, and financial feasibility reviews associated with materials recovery from waste streams.

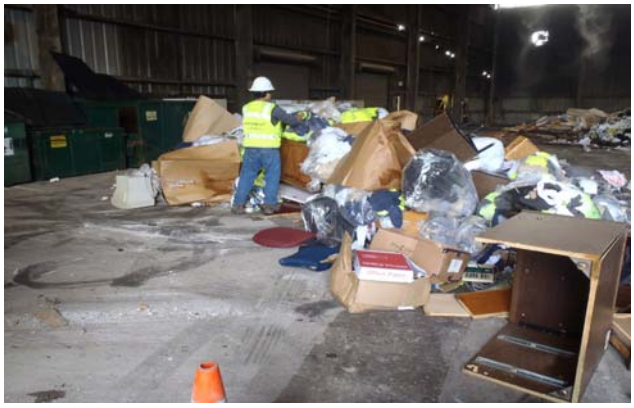
Historically, the recovery of recyclables from bulk waste in the United States was expensive and labor intensive, yet still resulted in poor quality end-products with little market value. Over the past five years, however, our client identified that rising commodity values in conjunction with improvements in automated sorting technologies were creating an opportunity to recover recyclables (and other materials such as organics) from bulk waste streams. The development of newer, automated systems have greatly reduced the operating costs of such systems, increased the number and types of materials that can be recovered, and improved the consistency and quality of the recovered materials. Prior to making a high-cost investment in automated machinery, our client turned to Geosyntec to better understand the volume and types of materials that could be recovered from existing waste streams at some of their facilities.

Geosyntec's Scope of Services

Between 2010 and 2011, Geosyntec's services included performing targeted waste composition analyses at waste transfer and disposal facilities in Delaware, Maryland, and Virginia. Recognizing that traditional waste composition analyses are exhaustive and expensive, Geosyntec developed an alternative waste composition investigation that would provide actionable information at substantially less cost. Geosyntec's knowledge that five to eight recyclable materials are targeted by automated recovery equipment coupled with the fact that wastes are typically collected using regular, repeated collection routes (thereby generating consistent wastes on each route) allowed us to perform a rapid initial screening of our client's customers. This identified collection routes with wet, commingled wastes (containing little recoverable material but potentially high organic loads), which allowed field efforts in support of recovering recyclables to be focused on routes dominated by dry wastes that tended to have fewer contaminants and are more readily separated by modern equipment. Using a three-day field investigation, Geosyntec was able to perform an efficient analysis of the composition and volumes of recoverable wastes received at each facility, broken down by collection vehicle, material type, and volume. With this information, Geosyntec was able to identify the anticipated volume and value of specific recyclables or organics received at the facility, thereby allowing our client to perform financial cost-benefit analyses for the proposed material recovery equipment.

Notable Accomplishments

Using a focused investigation guided by our understanding of waste collection systems, Geosyntec was able to quickly and cost-effectively help our client identify major recoverable components and volumes within the waste streams collected at its facilities. This information was vital to providing our client with the data needed to make informed "go, no-go" decisions regarding installation of multi-million dollar materials recovery equipment.



Geosyntec provided a cost-effective field analysis of waste composition to help our client determine the feasibility of materials diversion for fuel pellet production.

Client: Confidential

Services Provided:

- ✓ Hybrid visual/manual field sorting
- ✓ Targeted waste composition analysis
- ✓ Estimation of waste feedstock availability
- ✓ Assessment of waste feedstock calorific value

Project Objective

Geosyntec provides a wide range of technical services associated with determining the feasibility of emerging technologies, including field studies, literature reviews, and financial feasibility reviews associated with materials recovery from waste streams.

In an effort to find a better way to manage the ever increasing solid waste burden of the developed world and to turn municipal solid waste from an expense into a commodity, a national solid waste management company has started a program to pelletize waste into an alternative fuel source of consistent quality. Geosyntec was contracted to help characterize the incoming and outgoing waste at several landfills, transfer stations, and material recovery facilities (MRFs) as potential feedstock for fuel pellet production. This information is needed to inform where fuel pellet production plants can be most feasibly located. Because waste characterization studies can be time and labor intensive, Geosyntec developed a hybrid visual/manual waste characterization plan targeted to rapidly and efficiently provide the client with relevant information regarding the calorific value of available waste streams.

Geosyntec's Scope of Services

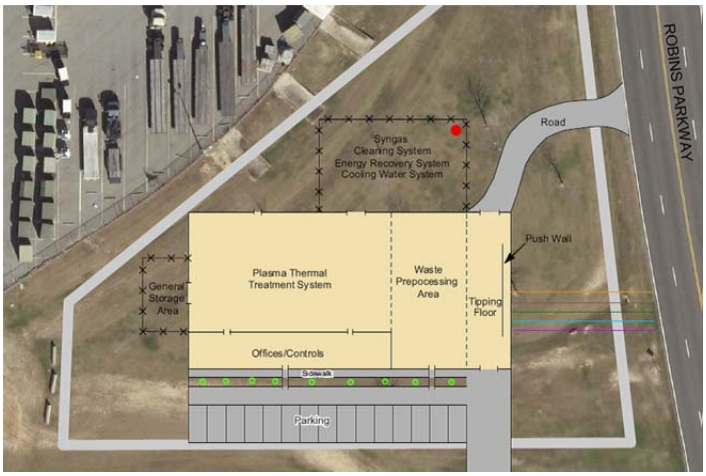
In 2012 and 2013 Geosyntec performed waste characterization studies to identify quantities of different materials available for use in the production of waste-derived fuel pellets. These studies were performed at seven locations across California, Illinois, Maryland, and Pennsylvania. In total, over 12 person-weeks of targeted field work were provided. Waste from incoming trucks was visually assessed for material composition by volume and the trucks were divided into different incoming categories. Based on review of waste delivery schedules and facility operation logs, selected loads of both incoming and outgoing waste were manually sorted and tested to determined material bulk specific weight, material composition by weight, and moisture content. Using the fact that many trucks deliver consistent waste loads, Geosyntec was able to take short-term field data and combine it with long-term scale house records to produce an accurate estimation of the quantities of different materials that could be diverted for fuel pellet production at each facility investigated.

Notable Accomplishments

Using a focused investigation guided by our understanding of waste collection systems and waste processing operations, Geosyntec was able to quickly and cost-effectively help our client identify the quantity and average calorific values of different materials potentially available as fuel pellet feedstock at several waste processing and disposal facilities. This served the client in providing the information needed to evaluate different sites as regional candidates for fuel pellet production.

Geosyntec consultants

Feasibility Study for Waste-to-Energy Technologies
Robins Air Force Base
Warner Robins, Georgia



Conceptual Layout of a Plasma Gasification Facility at the Robins Air Force Base

Client: Robins Air Force Base

Services Provided:

- ✓ Evaluation of Waste to Energy Technologies
- ✓ Preparation of Site-Specific Technical, Regulatory, and Economic Feasibility Study
- ✓ Recommendations for Implementing Selected Gasificaiton Technology

Project Objective

Robins Air Force Base (Base), located in central Georgia, has goals of reducing the quantity of waste that is sent from the Base to landfills, generating renewable energy on the Base, and reducing environmental impacts of the Base. Geosyntec was retained by the Base to conduct a Feasibility Study (FS) to evaluate currently available Waste-to-Energy (WTE) technologies that could potentially be utilized at the Base and to recommend the technology or technologies that are most favorable based on the types and quantities of wastes generated on the Base and potential to achieve the goals of the Base.

Geosyntec's Scope of Services

Geosyntec conducted a feasibility study which consisted of identification of WTE technologies, a preliminary screening of identified WTE technologies, and a detailed evaluation of a selected WTE technology. Geosyntec evaluated the Base waste streams and volumes as well as energy consumption and costs. Geosyntec also reviewed technical literature related to WTE technologies and conducted surveys of a few technology vendors. A preliminary screening of both thermal and bio-chemical WTE technologies was performed to identify the technologies that have the highest potential of meeting the Base's goals, which resulted in selecting plasma gasification for a more detailed evaluation. The detailed evaluation included assessing the technical, regulatory, and economic feasibility of implementing plasma gasification at the Base, as well as the development of a conceptual layout of a plasma gasification facility. For the economic feasibility analyses, Geosyntec considered several options that included different facility capacities in tons per day, importing of off-Base waste, and private developer participation. The financial analyses considered capital costs, operation and maintenance costs, feedstock cost, waste disposal cost savings, value of net electricity, renewable energy credits, carbon emission reduction credits, value of recovered metal and slag, and tax credits.

Geosyntec concluded that the application of plasma gasification at the Base is technically and economically feasible and should meet the Base's goals. Geosyntec recommended a path forward for implementing this technology at the Base including reviewing conceptual design details with technology vendors, discussing specific permitting requirements with the regulatory agencies, and soliciting detailed proposals from qualified vendors.

Notable Accomplishments

The WTE FS performed by Geosyntec provided the Base with the technical, economic, and regulatory rationales for selecting plasma gasification as the most feasible technology for the Base to reduce waste landfilling, generate renewable energy, and reduce environmental impacts. The FS also provided the Base with specific recommendations for implementing plasma gasification at the Base.

Geosyntec consultants

Landfill Gas to Compressed Natural Gas

DeKalb County, Georgia

Geosyntec is providing project oversight during design and construction phases for the LFG to RNG conversion facility and CNG fueling stations.

Client: DeKalb County

Services Provided:

- ✓ Landfill gas management system O&M
- ✓ Grant funding application assistance
- ✓ Regulatory liaison and negotiations
- ✓ Air permitting assistance
- ✓ Procurement assistance
- ✓ Grant compliance reporting
- ✓ Construction oversight

DeKalb County, Georgia (County) owns and operates the Seminole Road MSW Landfill (SRL), which is the second largest active MSW landfill in Georgia. The SRL has a capacity of 50 million cubic yards, and is anticipated to close in 2072. A Landfill Gas to Energy (LFGTE) facility located at the SRL site uses about 1,100 scfm of LFG, from the existing LFG collection system installed in Phases 1, 2, and 2A, to generate 3.2 MW of electricity by operating two Caterpillar G3520 engines. Excess LFG collected from the SRL is currently being flared in accordance with the regulations of the Georgia Department of Natural Resources (DNR). The County has installed additional collection wells in Phase 3 (active area) of the landfill as needed to maintain compliance. The County wished to develop a LFG to renewable natural gas (RNG) / compressed natural gas (CNG) conversion facility to utilize the extra LFG available, lower emissions from the landfill, and create fuel savings for the County's fleet vehicles.

Landfill Gas Consulting Services

Geosyntec performs Operation and Maintenance (O&M) services for existing landfill Gas Collection and Control System (GCCS), not only to maintain compliance per requirements of the New Source Performance Standards (NSPS), but also to support optimal operations of the LFGTE and LFG to RNG conversion facilities, which are revenue sources for the County. Geosyntec evaluated the existing GCCS at SRL with the specific intent of reduction in oxygen and balance gas contents in the LFG in preparation for the LFGTE and LFG to RNG conversion facilities, and optimized the GCCS to achieve significant reductions in both. In addition, Geosyntec evaluated and provided additional options to the County to further reduce the balance gas percentage. Geosyntec prepared and submitted applications to Georgia Environmental Protection Division Solid Waste and Air Protection branches to complete all the permitting requirements for this project.

Petroleum Reduction Grant Application Services

Geosyntec researched various funding options and identified a Department of Energy (DOE) and American Recovery and Reinvestment Act (ARRA) "stimulus" Grant opportunity that had come out under the existing Clean Cities Transportation Sector Petroleum Reduction Technologies Program. On behalf of the County and several partners, Geosyntec developed the application for this competitive grant that would award up to $15 million in funding to develop an LFG to RNG conversion facility, two CNG fueling stations, and purchase of fifty one (51) CNG fuel vehicles. The County was one of 25 projects (out of a total 110 projects) selected for award of the grant funding, and was the only one that included converting landfill gas to RNG / CNG.

LFG to RNG Conversion Facility & CNG Fueling Stations Procurement, Oversight, and Reporting Services

Geosyntec researched various LFG to RNG and CNG conversion technologies and assisted in preparation and administering of the Invitation to Bids (ITBs) for the Turnkey Design, Construction, and O&M of the LFG to RNG conversion facility and CNG fueling stations. Geosyntec conducted the pre-bid meetings, answered questions from bidders, and helped in the technical evaluation of the bids received. Geosyntec's involvement in this project with the County has continued into the design and construction phases of the project to provide overall project oversight services including conducting weekly progress meetings, review of overall design/layouts, permit applications etc. Geosyntec also prepares and submits all grant-related reports to Center for Transportation (CTE) and DOE which include monthly reimbursement reports, quarterly progress reports, and monthly operational data reports.

NEXIGHT GROUP

Municipal Wastewater Reuse by Electric Utilities: Best Practices and Future Directions

Client: American Society of Mechanical Engineers (ASME); Water Environment Federation (WEF)

NEED	NEXIGHT GROUP SOLUTION
For projects focused on the reuse of reclaimed water to be successful, municipal wastewater utilities and electric utilities must collaborate closely with one another and coordinate their efforts over long periods of time. The American Society of Mechanical Engineers (ASME) and the Water Environment Federation (WEF) engaged Nexight Group's help in bringing together experts who could help identify best practices and future directions for wastewater reuse efforts at power plants.	• Helped ASME facilitate more than 20 experts from electric utilities, municipal wastewater treatment facilities, and research organizations at the Best Practices and Future Directions Workshop. • Led workshop participants in identifying key characteristics of successful municipal wastewater projects; barriers to successful municipal wastewater projects; and next steps to overcome the barriers to success. • Captured workshop results to develop the Best Practices and Future Directions report, which outlines priority best practices and potential action plans that ASME and WEF can support to help new projects launch.

RESULTS

- Helping municipal wastewater plants and electric utilities to initiate new reclaimed water utilization projects.
- Guiding the efforts of ASME and WEF as they strive to support municipal wastewater projects.
- Published on asme.org and distributed at the WEF Technical Exhibition and Conference.

NEXIGHT GROUP

Sustainable Products and Processes Strategic Plan

Client: American Society of Mechanical Engineers (ASME)

NEED	NEXIGHT GROUP SOLUTION
Manufacturing is critical to the stability and growth of the U.S. economy. But, it also consumes vast amounts of energy and natural resources, produces substantial emissions, and creates significant quantities of waste. The American Society of Mechanical Engineers (ASME) recognized that it could have a significant role in increasing the use of sustainable manufacturing and asked Nexight to provide facilitation and communications support to help identify projects that could guide ASME's sustainability efforts.	• Worked with ASME to facilitate a strategic planning workshop with a committee of leading experts, including representatives of the U.S. Department of Energy, the U.S. Environmental Protection Agency, the U.S. Army, national laboratories, universities, and leading auto manufacturers and suppliers. The workshop focused on identifying high-priority projects that leverage ASME's unique resources and capabilities to address sustainability concerns. • Captured the results of the workshop to develop a strategic plan that outlines activities ASME can accomplish and that have the greatest potential for improving sustainability.

RESULTS

- Providing ASME with a targeted path forward for achieving a more sustainable manufacturing sector.
- Guiding activities focused on developing sustainability standards, establishing methodologies, hosting conferences and seminars, educating engineers and consumers, and conducting collaborative research projects.

NEXIGHT GROUP

New Hampshire Energy Assurance Plan Client: New Hampshire Office of Energy and Planning	
NEED	**NEXIGHT GROUP SOLUTION**
Recovery Act funding enabled New Hampshire to develop a draft Energy Assurance Plan that identified energy vulnerabilities and outlined response to major disruptions. Before finalizing the plan, the Office of Energy and Planning (OEP) engaged Nexight Group to help test response procedures in coordination with existing state emergency response and emergency operations plans.	• Designed a full-day seminar and tabletop exercise that engaged nearly 40 players from state agencies, energy providers, and critical infrastructure organizations. The event combined expert presentations with a challenging scenario that simulated a severe but realistic disruption for New Hampshire's energy resources, including an accident blocking critical waterways, a severe winter storm, and a loss of communications and information technology services during energy restoration. • Used a combination of full-group discussion and facilitated breakout groups to walk players through two escalating scenarios. Facilitated discussions asked participants to examine their response actions and identify specific gaps or needs. • Analyzed recommendations for improvement from participants and evaluators to develop an After-Action Report and an Improvement Plan, compliant with Homeland Security Exercise and Evaluation Program (HSEEP), that assigned specific roles and deadlines for improvement actions.
RESULTS	
• Helped participants test their roles and responsibilities and identify communications and operations gaps that could affect response in a real event. • New Hampshire is now using the After-Action Report and Improvement Plan to act on high-priority recommendations that will improve planning and response.	

NEXIGHT GROUP

Innovation Impact Report: Identifying Materials and Manufacturing Opportunities

Client: The Minerals, Metals & Materials Society (TMS)

NEED	NEXIGHT GROUP SOLUTION
To identify advances in materials and manufacturing with the potential to deliver significant energy, environmental, and economic benefits to the United States, TMS conducted a multi-phase study that brought together more than 100 materials science and engineering experts. These workshops resulted in a significant amount of raw data that was not easily accessible to their intended audiences.	• Facilitated more than 100 materials science and engineering experts representing societies of more than 75,000 scientists and engineers from industry, government, and academia. • Led the writing, editing, and design of the study's culminating 130-page Innovation Impact Report, organizing more than 50 breakthrough opportunities into five innovation impact areas and developing summary graphics and icons that allow readers to quickly gain understanding of high-priority opportunities and their anticipated market impact. • Organized, publicized, and moderated a webinar to release the results of the two-year study, and developed a 5-page electronic press kit to inform the media and invited webinar guests about the effort. • Conducted a multi-phase media outreach effort, developing a series of customized press releases and informational materials designed to share the results of the study with target audiences, including business leaders, policymakers, the scientific community, and the general public.

RESULTS

- Helping guide research and development efforts to advance high-tech research and manufacturing in the United States, allowing manufacturers and members of the research community to target opportunities that have the potential to deliver significant benefits in the short to medium term (two to ten years).
- Customized media invitations reached more than 300 contacts at trade and science publications, business presses, and professional journals.
- Webinar has been downloaded more than 200 times by members of TMS target audiences.

NEXIGHT GROUP

Chemical Sector Security Best Practices Public Listening Sessions Client: U.S. Department of Homeland Security	
PROBLEM	**NEXIGHT GROUP SOLUTION**
After a deadly explosion at a chemical plant, the White House established an inter-agency working group to identify best practices in chemical plant safety and security. Given the high level of emotions surrounding the explosion, the impact of chemical facilities on neighboring communities, and the importance of chemical facilities for the national economy, the working group identified the need for a third-party facilitator to manage the public engagement and ensure opposing groups had an equal opportunity to contribute to discussion.	• Managed eleven public forum sessions across the country with various stakeholder groups, including community groups, advocacy groups, and the chemical sector, to identify chemical sector security best practices • Facilitated each session to ensure process transparency and to provide each individual an equal opportunity to contribute • Reduced the logistical burden on inter-agency representatives, allowing them to better listen to the local concerns of participants
RESULTS	
• Suggestions, complaints, and best practices were collected from each of the eleven forums and were used to draft new regulations for chemical facilities.	

Cost Evaluation of Recycling and Transfer Options
Beaufort County, South Carolina

A. Goldsmith Resources, LLC provides ongoing support to Beaufort County Public Works, guiding staff and elected officials on ways to reduce costs of collection, recycling, and disposal. Most recently, A. Goldsmith Resources, LLC performed a long-term financial forecast of multiple scenarios for the development of recycling and transfer stations within this coastal county. A. Goldsmith Resources also conducted a site visit and interviewed stakeholders to recommend an improved approach for recycling and solid waste collection on an island within the County that is only accessible by boat.

Solid Waste and Materials Management Planning and Implementation
Macon-Bibb County, Georgia

A. Goldsmith Resources is working with this recently consolidated city-county government to look at materials and solid waste management in a new way. With visionary leadership, limited remaining capacity in the County's landfill, and an enviable location at the crossroads of major transportation corridors in Georgia, Macon-Bibb is using its solid waste management planning process to rethink the way it collects, diverts, processes, manages, and pays for solid waste. A focus of the effort will be to consider how to offer enhanced recycling and solid waste services as part of an initiative to attract businesses and residents into a thriving downtown business district.

Measure Georgia
Georgia Recycling Coalition

A. Goldsmith Resources, LLC, working with the Georgia Recycling Coalition, led the campaign to resurrect measurement of recycling in the State to demonstrate that recycling continues to provide economic and environmental benefits in the state. Since state government stopped requiring local governments to report recycling each year, Georgia only had anecdotal, rather than data-driven evidence that the state was still a national leader in recycling, hindering the recruitment of recycling and other businesses to the State. A. Goldsmith Resources guided the development of online tools to gather this information from local governments and private recyclers in a way that addressed their concerns about level of effort and confidentiality. Once these tools were in place, the project team drew on decades of relationships in the recycling industry to enlist the participation of local governments, processors, and end users managing recovered materials in the State.

Solid Waste and Materials Management Plan
Tennessee Department of Environment and Conservation

A. Goldsmith Resources is part of a team updating Tennessee's Solid Waste and Materials Management Plan. With input from nearly a dozen public meetings at throughout the planning process, the team developed goals and objectives to enable Tennessee to move away from solid waste disposal and toward materials management over the next ten years. Once final, the goals and objectives were supported with strategies and tactics to progress to where the state wants to be by 2025. A. Goldsmith Resources created a detailed and interactive electronically based roadmap for the State and other participants to use in annual budgeting and planning to implement the plan.

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Offices in Principal Cities of the United States and Select International Locations

geosyntec.com

Geosyntec consultants

10220 Old Columbia Road, Suite A
Columbia, Maryland 21046
PH 410.381.4333
FAX 410.381.4499
www.geosyntec.com

28 July 2015

Mr. Chris Skaggs, Executive Director
Northeast Maryland Waste Disposal Authority
Tower II, Suite 402
100 South Charles Street
Baltimore, Maryland 21201

Subject: Response to Questions
Proposal for Solid Waste Management Options Study
Frederick County, Maryland

Dear Mr. Skaggs:

This letter has been prepared by Geosyntec Consultants (Geosyntec) to address a number of questions asked by the Northeast Maryland Waste disposal Authority (the Authority) and Frederick County (the County) regarding our May 2015 proposal to provide professional services associated with performing a study regarding future waste management options in the County. In this response, the questions received by the Authority are reprinted with our response immediately following.

GENERAL QUESTIONS

Question 1: The Scope of Work essentially calls for the consultant to analyze/compare a broad number of solid waste technologies, and facilitate meetings in which public input is solicited. With regard to your experience, for each of these three tasks, please indicate the number of times your firm (or sub) has conducted the task (both corporate and individual experience) and describe your best example (i.e. the most similar to what we will do in Frederick County). Please also provide similar information regarding your firms experience with waste sorts.

Response: Nexight Group has facilitated hundreds of meetings, including many during which public input was solicited. For example, we facilitated a series of public meetings on the chemical sector security during which members of the general public attended and offered remarks. One such meeting in Texas occurred relatively soon after a significant accident which caused injuries and fatalities. Because family members in attendance provided highly emotional comments, the meeting had the potential to be highly contentious and unproductive. We facilitated this meeting using a calm, professional approach designed to allow all members of the public to have their say while remaining on time and focused on the topic at hand. Mr. Brindle, the lead facilitator proposed from Nexight Group, has personally facilitated more than 250 workshops on six continents. Nexight Group does not have direct experience with waste sort projects.

Most of the solid waste planning projects Abby Goldsmith has conducted in recent years involve facilitating meetings to solicit public input on solid waste management and diversion options and involve as assessment of solid waste technologies. At least six recent projects have focused on assessing solid waste technologies and most of these entailed gathering input from the general public in meetings, steering committees, elected officials, and staff.

For example, as part of a project designed to enable the City of Phoenix to reach a 40 percent waste reduction goal, Abby Goldsmith conducted strategy sessions with staff and workshops with a Project Advisory Group (PAG) to present and gather input on which solid waste technologies and options would to be evaluated, the criteria by which they would be evaluated, the weight of each criteria, and then, based on our analysis, the appropriateness of each option individually and combined with others.

Abby Goldsmith has also overseen over a dozen waste characterization studies, and Geosyntec has performed over a dozen waste characterization and composition studies, as described in Section 5.4.6 of the proposal.

Question 2: The Scope of Work called for developing a scope for a waste sort in Phase II, which would be undertaken at the County's option. What is an estimated cost for a four season waste sort? If you were asked to start a 4-season representative fully characterized waste sort early in Phase I, how would that impact cost and schedule? If you were asked to make do with data from either an older Frederick County waste sort and/or data from a neighboring county, how would that impact cost and schedule? If schedule is impacted, please revise your Gantt chart.

Response: A four-season waste sort at the Frederick County Transfer Station would require the Phase 2 of project to be expanded by approximately 6 months. Our revised Gantt chart for the project is attached. In addition, under the assumptions described below, we estimate it would add $35,000 to the project budget for a tightly scoped sort. Please see our response to Specific Question 4 (below) for additional information regarding our response to this question. Note that we have assumed that the County will provide a rubber tired backhoe or other similar piece of equipment with operator to support Geosyntec field staff in the waste sort.

Note: As an alternative, if a detailed, four season waste sort that meets general industry standards for statistical significance, (30 samples per season of for up to 30 targeted materials, this would add an additional $100,000 to the budget (as an alternative to the scoped $35,000 sort described above). Please refer to our response to Specific Question 4 below as we believe that this is an opportunity for the County to save significant project costs without sacrificing the quality of the final report.

With respect to using existing data as an alternative, we had contemplated in our proposal the use of existing data as an alternative to the time and expense of a four-season, fully characterized waste sort. As stated on Page 14 of our proposal "Initial screening of potential conversion technologies can be performed using waste information from published sources, available databases, and existing waste/recycling data from the County and surrounding areas." Therefore, in this case there would be no impact on cost or schedule.

Question 3: The Scope of Work calls for up to four half day onsite meetings (e.g. a kickoff meeting) between the contractor and Frederick County staff/Steering Committee? Assume key staff from your team/subs would attend. If you assume four meetings, how does this impact your cost estimates? If you assume 5 meetings, how does this impact your cost estimates?

Response: As described in the introduction to Section 2 of our proposal, we currently assume the Project Manager (Jeremy Morris) and Lead Workshop Facilitator (Ross Brindle) will attend up to five on-site meetings. Should the County desire Abby Goldsmith to also attend the on-site meetings, the additional cost for the project would be $10,000.

Question 4: Technology analysis. Assume that you will analyze the technical, environmental, political, and financial aspects of several waste management technologies including traditional approaches, nontraditional alternatives, and continued reliance upon out-of-state disposal. Assume that every technology proposed by the public will require either complete analysis or a response with regard to why it is not fully analyzed.

a) Do you favor a process by which some technologies are knocked out prior to being fully analyzed (understanding that doing so would require clear, thoughtful, and documented reasoning)? If so, upon what bases might a technology be knocked out (e.g. excluded due to inability to meet laws, regs, or permitting requirements).

Response: As described under Task 1.6 of our proposal, the Geosyntec team will review of a number of non-traditional waste management technologies as part of the scope of services. The review will include up to six (6) different technologies as described in Task 1.6. Note that we are using the term "technologies" to mean engineered processes used to physically process or treat waste. While in concept there are more than six (6) technologies that exist to manage solid waste, in order to prevent the project from becoming completely unwieldy and excessively expensive, some technologies should be removed early in the process. As characterized by USEPA, deployment and development of a technology can be viewed on a continuum which ranges from concept, to bench scale, pilot scale, semi-commercial and finally commercial scale development (note that there are a number of technologies being promoted in the marketplace today which do not meet the threshold of commercial scale). We recommend that one of the first steps in this task would be for the consultant to work with the County to determine whether there are any criteria that a

technology must meet to be considered at all. It is our assumption that the County would not pursue technologies that carry a high risk of failure for the County because they are unproven, have a track record of failure, or are unlikely to be permitted. The Geosyntec team has always encouraged thoughtful, prudent innovation within our industry, but we also recognize where innovation ends and risky speculation begins.

Assume 6 technologies are chosen for full analyses. How does this impact your cost?

Response: As described in our response to the previous question, our current proposal assumes up to 6 technologies are chosen for review. Therefore, there is no impact to cost.

b) Assume 12 technologies are chosen for full analyses. How does this impact your cost?

Response: In order to expand the number of technologies for review to 12, we have estimated that an additional $24,000 would be required for the project. Please note that extremely new and/or developing technologies have very little verifiable cost or performance data available. Therefore, the ability to perform a "full analysis" becomes limited, and the ultimate reliability of such an analysis begins to lose its value.

c) Solid waste management options to analyze may include composting, landfilling, materials recovery facilities, reduction (public education), anaerobic digestion, "clean" and "dirty" materials recovery facilities, C&D recycling, electronics recycling, other recycling, resource recovery parks, Pay as You Throw programs, and Zero Waste Plans. Which of these (feel free to add others) do you have experience conducting analysis and comparative reviews? For which do you have experience developing programs? Were they successful? Are they still in operation?

Response: Abby Goldsmith, the lead reviewer for the project team, has conducted analysis and comparative reviews that include all of these options. She has developed and operated programs for landfilling, material recovery facilities, and reduction (public education), other recycling over the past 25 years as a county recycling coordinator and as a consultant to local governments and many of these are still in operation.

d) Assume criteria for selecting a waste management technology will be developed in consultation with the Steering Committee. The chosen technology could be a combination of technologies. How do you propose to analyze combinations of technologies (e.g. single source, multi-source, best of breed)?

Response: Once the technologies are selected, the Study Team will create a matrix to identify how the technologies complement, conflict, or have no effect on each of the other technologies. From there, we will work County to determine if some of the alternatives

selected for detailed analysis should be a combination of options rather than individual options. In other words, the final evaluation could be of *systems* rather than of individual technologies. This approach was taken on a similar project for the City of Phoenix referenced above.

e) The performance of a particular solid waste management option may be impacted by changes in economic indicators, technology design, waste stream composition, commodity prices, transportation costs, trash and recycling volumes, participation rates in voluntary programs, and/or regulations. Assume that a sensitivity analysis will be conducted. Please describe how you would perform such as sensitivity analysis. Will it include probabilities? Does this affect your cost estimate?

Response: The assumptions for each option evaluated will be presented in the initial analysis. If the County would like to evaluate a specific solid waste management option under more than one set of assumptions (conduct a sensitivity analysis), the Study Team can complete this task at an additional cost. The exact cost for this work cannot be determined at this time because it would depend upon the number and types of assumptions selected. It is important to understand that the financial analysis of a particular solid waste management option requires the input of a large number of assumptions (for example, 10 were identified in the question). Performing sensitivity analyses on multiple variables will rapidly increase the complexity and effort by orders of magnitude, and therefore we caution the County against the temptation to attempt to analyze every conceivable variable. A better approach is simply to have confidence that assumptions have been reasonably and conservatively selected.

f) Cost is one criteria that will be used to evaluate various technologies. What cost analysis, accounting standards, and/or other best practices do you propose using?

Response: Once selected, the Study Team will propose inflation rates, interest rates, and other accounting standards for the financial analysis to the County, making adjustments after review with the County and before beginning the financial analysis of the various options selected.

g) Do you possess any particular intellectual property (e.g. cost analysis software, selection criteria worksheets) that could or should be used in the analysis of waste management technologies that would be useful to the process? If so, to what extent would it need to be modified?

Response: Yes. We will draw from material used in past analyses including a preliminary list of options, a preliminary list of criteria, spreadsheets and presentation materials to gather input on weighting the criteria and narrowing down the list of technologies to be evaluated. The Study Team has developed our own spreadsheets that can be used to analyze the more quantitative criteria such as capital and operating cost and diversion potential. We will need to

modify these resources to reflect the County's selected technologies and criteria and them to modify assumptions for the base case (i.e. market prices for recovered products or energy, transportation and landfill disposal costs, interest, inflation rates, participation rates, waste composition).

h) Assume that the analysis that you use to evaluate technologies will be scrutinized. It would need to be clearly presented, perhaps as an appendix to a report. Does this change your cost estimates?

Response: No. A copy of the analysis will be included as an appendix to the report. However, any proprietary models used in the analysis will not be included.

Question 5: Regarding your facilitated public meetings and other forms of public input:

a) We are not sure how many people will attend each meetings (5? 10? 25? 50? 75?). What is reasonable or ideal? How would the number of attendees impact your cost estimates?

Response: Given that the County is currently reviewing solid waste management options, as opposed to proposing specific facilities at specific sites, we would expect that typical public meeting turnout would be between 15 and 30, with the majority of the participants being those who have some prior knowledge and interest in promoting specific concepts. It is also likely that a handful of the participants will attend more than one, or even all of the meetings. It is possible that as the public meetings progress, general interest may accelerate, resulting in greater attendance.

The ideal number of attendees is less than 30, so that each individual can be heard and, ideally, some group discussion can occur. However, Nexight Group has experience facilitating workshops with as few as 5 participants and as many as 300 or more. We customize the agenda and facilitation process to achieve the desired outcomes within the time available and with the number of participants in mind. The number of attendees will not impact our cost estimate for meeting facilitation, unless Frederick County wishes to engage in parallel breakout groups for in-depth discussion. If this is desired, then our best practice is to limit breakout groups to 20 participants and to have a dedicated facilitator for each breakout group. Given the subject project's requirements, we do not believe parallel breakout groups will be required.

b) What strategies would you use to increase the turnout at public meetings?

Response: If large turn-out is desired, we would recommend a variety of outreach strategies designed to achieve such turnout. Strategies could range from standard public notice procedures the County already uses to direct outreach to citizen groups with active interest in waste management and environmental impact, social media outreach, and even general

advertising in local newspapers or radio. The County should conduct a simple cost-benefit analysis to determine the most effective outreach method.

c) Once assembled, what logistical strategies would you use to obtain public input on technologies (e.g. nominations, exercises, etc.)? What is your experience with such strategies?

Response: Nexight Group uses a variety of facilitation techniques to stimulate and structure group discussions, tailored to the specific outputs and outcomes desired from each meeting and the number and nature of participants. For meetings with 10-30 members of the public with varying levels of knowledge regarding technologies, we would likely structure sessions to balance presentations that offer additional information on each technology followed by individual comments and facilitated group discussions of the benefits and drawbacks of the technologies. Ultimately we would work toward group consensus regarding the most promising technologies for the County to pursue. Nexight Group has extensive experience with such strategies; all of the more than 350 workshops facilitated by Nexight Group staff are carefully designed to create exercises that help participants deliver the desired outcomes of each meeting.

d) How might a public meeting go badly (e.g. single or multiple hostile attendees, an outspoken attendee with an agenda, passive attendees reluctant to provide input, low attendance, etc.)? What steps would your facilitator take?

Response: Public meetings can go badly in many ways without effective facilitation. Hostile attendees can come with the express purpose of inciting arguments and derailing productive discussions. Company representatives can attend with the singular goal of promoting their product or service, regardless of the actual advantages. Some attendees attempt to dominate discussions while others remain quiet unless drawn out specifically. Meetings can also go badly due to an ill-suited physical setting (room is too large, too small, too hot, too cold, too noisy, etc.). Finally, attendees can arrive with differing expectations regarding the meeting purpose and scope, leading to unproductive discussions. Nexight Group uses careful and thorough preparation to avoid such pitfalls. By clearly articulating the purpose, scope, ground rules, and a timed agenda for the meeting ahead of time, participants arrive with a better understanding of what to expect. Nexight facilitators use a wide range of techniques designed to balance participation, ensuring that all people are heard without affording any individual an opportunity to dominate the discussions. With hostile participants in particular, it is important for the facilitator allow them to voice their concerns and provide tangible evidence that they have been heard, such as writing the concerns on a flipchart paper or white board. Then, if such participants attempt to continue making the same remarks, the facilitator can confirm that the participant has been heard and recorded and move the discussion onward. Other techniques include strategic stretch breaks to calm tensions, rearranging physical seating to shift group

dynamics, and at times, directly challenging disruptive participants to make positive contributions. In short, careful, deliberate meeting planning well in advance of a meeting, paired with a highly experienced facilitator who has "seen it all" can greatly increase the likelihood that a public meeting achieves its desired outcomes and is a success.

e) If, during the course of conducting public meetings, a change in strategy became necessary, how might that affect your cost estimates?

Response: The impact of strategy changes on the cost estimate cannot be determined at this time, as it is dependent upon the scope and magnitude of the change. Nexight Group facilitators often are required to adjust meeting strategies in response to the unique dynamics of the group assembled. This is part of our professional services as currently proposed. If this question refers more broadly to a shift in overall project strategy, then it is not possible to answer without making many assumptions regarding the change in strategy envisioned and associated costs. For example, a strategy change that simply adjusts meeting times from the afternoon to the evening to encourage greater turnout by the public would have no cost impact, whereas a decision to triple the number of meetings, or radically change the format of the presentations could have a significant impact on the budget.

f) The Scope of Work directs the consultant to facilitate up to six public meetings. Assuming six public meetings, how would that impact your cost estimates? Assuming 10 public meetings, how would that impact your cost estimates? If some of those meetings were with particular stakeholder groups (e.g. haulers, environmental groups, etc) rather than general public meetings, would that impact your cost estimates? Do you have an opinion on the number of meetings that should be held and with which audiences?

Response: Meetings with specific stakeholder groups instead of the general public would not affect costs and could yield more useful outputs for the project due to the more informed perspective. Generally speaking, public meetings do not vary greatly in terms of output, so the County should conduct as many public meetings as it deems necessary to fulfill public engagement expectations. Additional stakeholder meetings with targeted groups like haulers and environmental groups offer additional value and we would recommend the County hold these meetings instead of additional (possibly redundant) general public meetings.

The Nexight Group costs for facilitating a one-day public meeting is $5,000. Therefore, six public meetings would cost $30,000; 10 public meetings would cost $50,000 (this includes the cost for documenting each meeting).

g) Other than public meetings, what strategies would you use to increase public involvement in the technology identification process (e.g. social media, newspapers, surveys, contests, etc.)?

Response: The County could pursue several additional mechanisms for soliciting public involvement in technology identification. Social media engagement via Facebook, LinkedIn, Twitter, Instagram, and other social media sites could generate increased awareness and discussion. An online survey available to all members of the public could also yield useful public input, although resources will be required to analyze survey results to extract valuable insights. Contests with modest prices can be effective engagement mechanisms if they are accompanied by carefully crafted challenge statements that help shape effective responses and targeted outreach that builds awareness about the competition. One additional public engagement approach is direct, in-person engagement in the form of one-on-one conversations and/or survey completion during public events. Such outreach can be particularly cost effective if conducted in partnership with a non-profit organization also interested in the mission, as long as the organization is committed to reporting the true public input.

Question 6: Do you have the capability of conducting a survey of Frederick County residents by mail and/or phone, using a representative unbiased sample of respondents that maintains confidentiality? About how many people would be in the sample? Could you assist in developing questions? Could you develop willingness-to-pay questions? Could you do cognitive testing of questions? Assuming a sample size of 400, how would this impact your cost estimate?

Response: Nexight Group routinely conducts telephone surveys with members of the general public to solicit input on a variety of topics. Our approach carefully documents each respondent's viewpoints while maintaining strict confidentiality. We only present aggregated results that represent areas of consensus and differences. We build customized survey result dashboards and infographics that present survey results in dynamic, interactive ways that allow users to query the dataset and extract additional insights. A typical sample size would be several hundred respondents, although we have experience with much larger and smaller groups.

Yes, the Study Team could assist in developing questions and willingness-to-pay questions, as well as limited cognitive testing of questions. This scope of work is not included in the current cost estimate. We estimate that conducting a 400-person telephone-based survey and analyzing results would cost approximately $30,000.

Question 7: Do you have any suggestions for working with state agencies such as MDE and Dept. of Agriculture as allies rather than obstacles with regard to composting or other issues?

Response: Should and client or consultant consider regulatory agencies to be an obstacle, they have already severely handicapped the project and will make success much more difficult to achieve. Having worked with multiple regulatory agencies in multiple states, it has been our consistent experience that Maryland regulatory agencies are quite reasonable to

work with, and we have found that bringing technically well thought out, complete proposals that address regulatory review requirements has consistently resulted in a favorable working relationship with all Maryland agencies. Our recommendation for working with other stakeholder groups is to engage them directly in the planning process, carefully listen to their viewpoints to ensure they are heard, and look for opportunities to find win-win outcomes that meet County needs while responding to their concerns. By proactively engaging agencies in the process, the County has a much better chance to find win-win solutions that meeting County objectives.

Question 8: Do you see any pitfalls in our proposed Scope of Work? Do you have any suggestions to avoid them?

Response: We do not see any major pitfalls in the proposed approach. However, we would caution the County to: (1) consider establishing minimum criteria that a technology must meet to be considered; and (2) be careful not to propose too many public meetings. Both of these issues represent a significant cost to the project, and overly broad samples of either have diminishing returns.

SPECIFIC QUESTIONS

Question 1: In one place your proposal states "Mr. Brindle has facilitated more than 250 vision and technology road mapping workshops, strategic and program planning meetings, industry working groups, and executive seminars on six continents." In another place, it says 350. In addition to clarifying the number, could you elaborate on, summarize and/or categorize these meetings by the type of facilitating that was done (e.g. examples of exercises used to obtain input from attendees)? What kind of audiences were they? How large or small were these facilitated meetings? Did any of the meetings become heated? If so, what actions were taken to resolve the situation? Any additional information would be useful.

Response: Mr. Brindle has personally facilitated more than 250 workshops. Nexight Group staff members have facilitated more than 350 workshops. The types of facilitation exercises and attendees have been highly diverse. Mr. Brindle is experienced leading executive-level workshops of business leaders, senior government officials, and world-leading academic researchers including several Nobel Laureates. Mr. Brindle is also highly experienced leading meetings with the general public, who often have little technical knowledge of a topic being discussed. Meetings range in size from 5 participants to more than 300; larger meetings often feature parallel breakout sessions that Mr. Brindle engages other Nexight Group facilitators to manage concurrently. Many of these meetings have become emotionally heated, often because different business leaders or technical experts often disagree on the most promising path forward. Mr. Brindle uses facilitation techniques as described earlier (careful listening of different viewpoints, recording views on visible media

so participants feel heard, use of breaks to calm tensions, and (carefully) directly challenging participants to offer a positive or constructive comment. Mr. Brindle excels in restating conflicting viewpoints and then asking other participants to help resolve the disagreement. If the County wishes, Mr. Brindle would be happy to participate in a pre-award call or meeting to explain further his facilitation philosophy, experiences, and approaches.

Question 2: On page 16, your proposal states "it is assumed that a Steering Committee or County staff member will be appointed to synthesize comments on which there is consensus." It is not clear if you are referring to Steering Committee comments on Geosyntec draft reports or comments obtained at public meetings. Assume the Steering Committee will summarize its own comments but Geosyntec will track and summarize comments at public meetings. How does this impact your cost estimates?

Response: There are two separate review processes described in our proposal under Task 2.4. The first involves the submittal of the Draft Phase 2 Report to the Steering Committee for review and comment, and includes a 45-minute PowerPoint presentation. Through this process, we assume the Steering Committee will come to a consensus regarding the Committee comments to be incorporated into the Draft Phase 2 Report.

The second process involves the posting of the Draft Phase 2 report for the 45-day public comment period. For this process, we have assumed that the County will create a landing space on its own website for submittal of public comments. The comments would be collected from a comment box on the landing page established by the County. We have assumed that the County will be forward comments from the web site to the Study Team. During this process, it is expected that some of the comments received may have only tangential reference to the project or may involve topics that are outside of the scope of the project. In such cases, we have assumed that the Steering Committee will provide feedback to the Study Team regarding what comments are appropriate to address in the report. In addition, we have assumed that no more than 100 substantive public comments will be received.

To capture and summarize public comments for the Steering Committee during the 45 day review cycle as described above would add $6,000 to our proposal.

Question 3: On page 16, your proposal states, "The Study Team will incorporate comments and changes in a "living" electronic version of the draft report." Please explain and elaborate on how document controls are established to ensure consultant responsibility for the report content. For example, an individual's preferential changes may or may not be appropriate. How will these changes be accepted or rebutted and tracked?

Response: Geosyntec will establish a SharePoint system for the Study team that enables multiple people to work on a document concurrently in order to create efficiency through

collaboration. The SharePoint system both tracks changes to a document made by each individual and it keeps an archive of each version of the document that is saved at any point in time. The Study Team staff will have the ability to see what changed in a given version or "pull" a prior version from hours or days ago. This provides control and tracking. Changes will be accepted or rebutted based on a daily review.

Question 4: The Scope of Work calls for development of a four season waste sort scope with the option to exercise this sort at the discretion of the County. In Section 2.3.2 Task 2.2, it is stated "field performance of waste sorting is not included in the scope of this proposal," so this does not appear to be what Geosyntec has assumed. Are you unable to provide this service? If you are able, answer question 2 under For All Forms That Submitted Proposals.

Response: Our proposal includes the development of a scope of work for a four-season waste sort scope, but not execution of one. We are able to provide this service at the discretion of the County. Note that the cost of the waste sort is highly variable depending upon the complexity and scope expected. As described under Task 2.2 in our proposal, we do not recommend that the County perform a "brute force" waste sort that attempts to sort a large, random volume of material into 10 or 12 waste categories before the potential waste conversion technologies are identified. This is because such an approach is both very expensive and yields no more value to the County than a smaller-scale, tailored waste sort that is targets the specific feedstocks after a specific conversion technology is identified. For example, if anaerobic digestion is a technology that is being considered for detailed evaluation, expending resources to sort loads that are dominated by demolition debris (which is not appropriate for this technology) is not a productive use of the budget.

Some may argue that a large-scale, general waste sort is needed as a precursor to identify what conversion technologies should be considered, but past experience teaches that existing waste stream data available to the County, coupled with an overall understanding of the marketplace (i.e. what entities collect and control commercial, residential, and construction waste streams) is sufficient with regard to pre-screening conversion technologies.

As stated in our response to General Question No. 2, a tailored waste sort of the kind recommended in our proposal will cost approximately $35,000 for four events that occur over three days each.

Question 5: Geosyntec states that a community outreach meeting is to be conducted "on-line" and is "compatible with County needs." This is OK with the Department. Is Geosyntec proposing that it will conduct an entirely, internet-based community outreach meeting and will handle all technical aspects of such a meeting? Is Geosyntec expecting County IT assistance with such a proposal?

Response: The reference to online meetings was specific to one of the five meetings to be held with the Steering Committee and other County personnel. Page 6 of our proposal reads: "As described in subsequent subsections and shown in the proposed study schedule (Section 3), up to five meetings with the Steering Committee and other County personnel are proposed under Phase 1. Currently, it is assumed that these will be in-person meetings held at County facilities; however, the Study Team will seek the opportunity to hold one or more of these meetings online if that is compatible with the County's needs." We hope this clarifies this issue.

Question 6: The Scope of Work intended for the draft workshop report to be a deliverable item prepared independently by the consultant and based on comments and feedback resulting from the workshops. It was intended that the selected consultant to manage comments from the workshops and public comment period, but section 2.3.4 states "It is assumed that a Steering Committee or County staff member will be appointed to track and consolidate public comments received." "Again, it is assumed that a Steering Committee of County staff member will be appointed to synthesize comments on which there is consensus." Are you unable to provide this service? If you are can, how does doing so impact your costs?

Response: Please refer to our response to Specific Question 2.

CLOSING

Geosyntec appreciates the opportunity to offer professional services to the Authority and the County. If you have any further questions, please do not hesitate to contact us at (410) 381-4333.

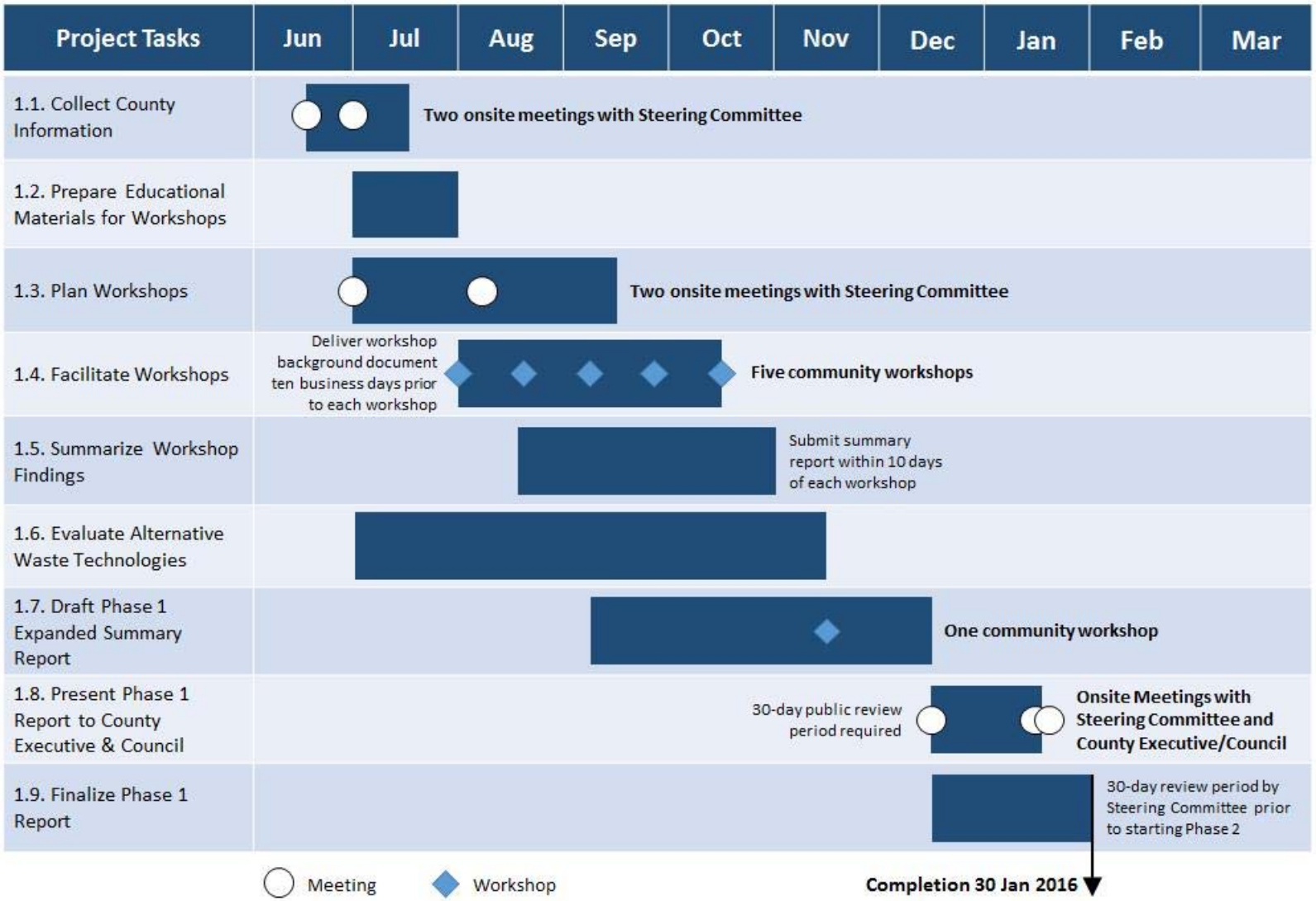
Sincerely,

Thomas B. Ramsey, P.E.
Associate

Attachment

Geosyntec consultants

10220 Old Columbia Road, Suite A
Columbia, Maryland 21046
PH 410.381.4333
FAX 410.381.4499
www.geosyntec.com



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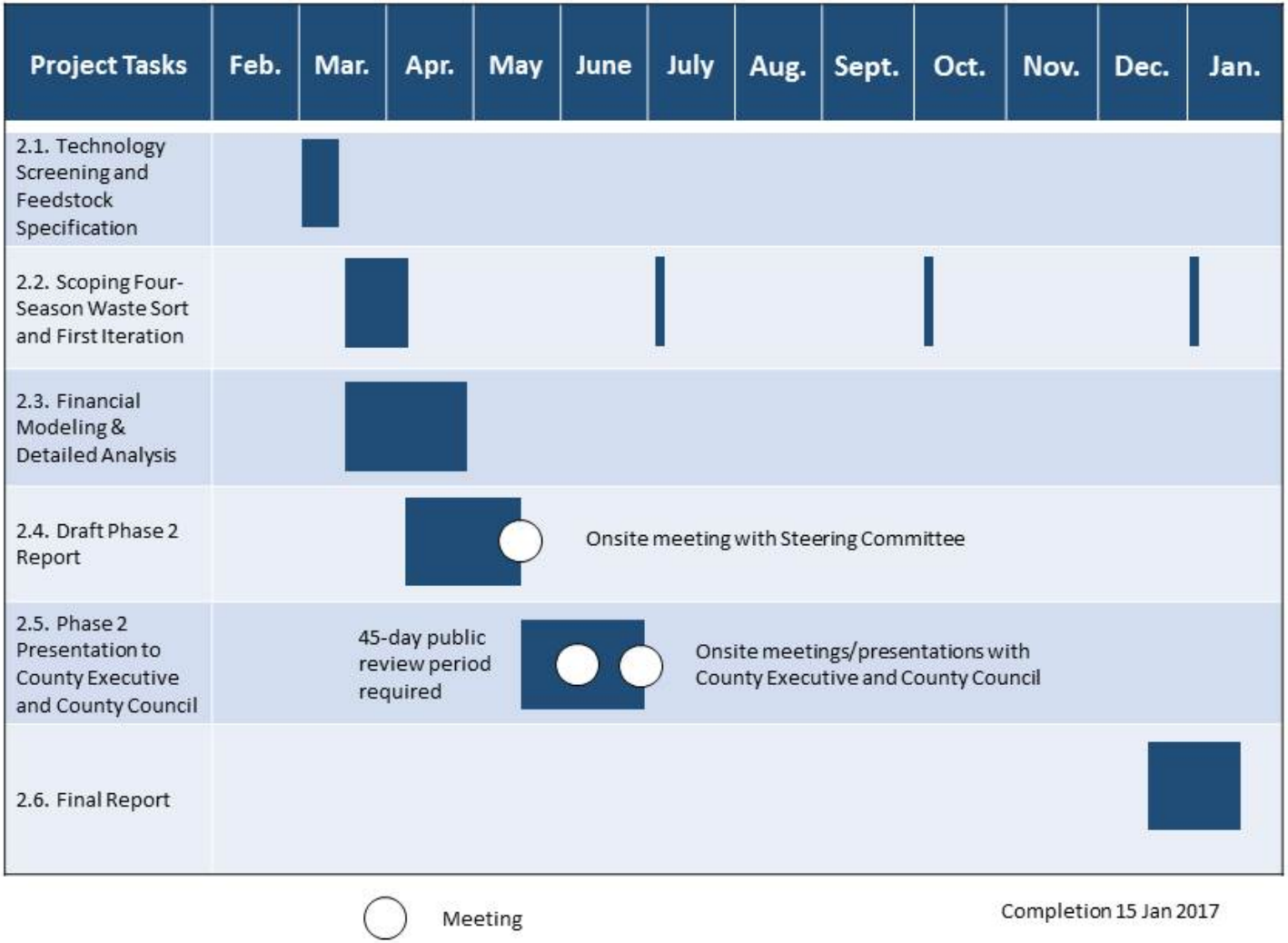

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Columbia, Maryland 21046
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FAX 410.381.4499
www.geosyntec.com

28 August 2015

Mr. Chris Skaggs, Executive Director
Northeast Maryland Waste Disposal Authority
100 S. Charles Street, Tower II – Suite 402
Baltimore, Maryland 21201

Subject: Clarification of "a La Carte" Pricing for Potential Scope Modifications
Proposal for Frederick County Solid Waste Management Options Study

Dear Mr. Skaggs:

At the request of the Frederick County Steering Committee following our meeting on Tuesday 25 August 2015, Geosyntec is pleased to provide this clarification of "a la carte" pricing for potential scope modifications to a number of tasks comprising the proposed study. This clarification serves as a supplement to Geosyntec's original proposal dated 6 May 2015 and subsequent response to questions dated 28 July 2015. The original and supplemental proposed scope of services will be delivered through Geosyntec's existing on-call contract with the Authority.

This supplemental submission comprises a cover page plus eight (8) additional pages.

We look forward to continuing our long-term relationship with the Authority on this project. Should you have any questions, please do not hesitate to contact the undersigned at (410) 381-4333.

Sincerely,

Jeremy W.F. Morris, Ph.D., P.E.
Project Manager

Thomas B. Ramsey, P.E.
Project Director

Task 1-3 (Plan Workshops)

Current scope includes:

- Preparation of Workshop Background Document (to incorporate educational materials developed in Task 1-2)
- Two 2-hour onsite planning meetings with the Steering Committee; attendance by Ross Brindle (Nexight) and Jeremy Morris (Geosyntec)
- Support of the Steering Committee's efforts to publicize the workshops to attract participation from County residents and stakeholders

Additional scope items may be added as follows:

Scope Item	Additional Cost	Assumptions
Additional Planning Meeting with Steering Committee	$500 per meeting	Ross Brindle (Nexight) attendance only
	$500 per meeting	Jeremy Morris or Tom Ramsey (Geosyntec) attendance
Additional Outreach Support	$30,000	Telephone survey (targeted interviews) provided by Nexight (planning, survey, and data analysis) without County support ***Per response to previous Question 6***
	$20,000	Telephone survey (targeted interviews) planning and data analysis by Nexight with telephone survey conducted by County personnel
	$15,000	Online survey (design, data collection, and data analysis) provided by Nexight without County support
	$11,000	Online survey design and data analysis provided by Nexight with data collection conducted by County personnel using County website supported by County IT dept. and other personnel
	$10,500	Social media campaign design and content provided by Nexight with County support using existing County social media channels

Task 1-4 (Facilitate Workshops)

Current scope includes:

- Five 2-hour workshops with attendance by Ross Brindle (Lead Facilitator) plus Assistant Facilitator and one other Nexight staff person
- Attendance at first workshop by Tom Ramsey and Jeremy Morris (Geosyntec)
- Expected attendance levels of 15-100 members of the public, single meeting (no breakouts), no interactive media

Additional scope items may be added as follows:

Scope Item	Additional Cost	Assumptions
Additional Attendance at Existing/New Workshops	$500 per workshop	Jeremy Morris or Tom Ramsey (Geosyntec)
	$500 per workshop	Abby Goldsmith attendance via WebEx or other online media
	$2,000 per workshop	Abby Goldsmith in-person attendance ***Per response to previous Question 3***
Additional New Workshop with same format as Existing Workshops	$5,000 per workshop	***Per response to previous Question 5(f)***
Additional Capacity at Existing or New Workshops with same format as Existing Workshops	$1,000 per workshop	Up to 150 public attendees, requiring one extra Nexight staff person
Adding Breakout Groups at Existing/New Workshops	$0	Less than 40 public attendees (breakout groups can be managed using existing Nexight personnel)
	$1,000 per workshop	Less than 60 public attendees (one additional Nexight staff person required per additional 20 public attendees)
	$2,000 per workshop	Less than 80 public attendees (one additional Nexight staff person required per additional 20 public attendees)
	$3,000 per workshop	Less than 100 public attendees (one additional Nexight staff person required per additional 20 public attendees)
	N/A	Greater than 100 public attendees – facilitated breakouts not recommended due to cost and logistical issues
Added use of County-owned interactive media such as real-time electronic display/input	$0	County personnel responsible for operating interactive media; Nexight will consult with County for optimal use of electronic systems as part of existing planning budget

Task 1-6 (Evaluate Alternative Waste Technologies)

Current scope includes:

- Initial summary of technologies theoretically available, reduced to in-depth evaluation of six technologies based on County guidance regarding evaluation criteria

Additional scope items may be added as follows:

Scope Item	Additional Cost	Assumptions
Additional Technology Reviews	$4,000 per technology or combination of technologies	Level of evaluation effort consistent with the approach outlined in the proposal 50/50 split in effort between Geosyntec and Abby Goldsmith per technology ***Per response to previous Question 4(b)***

Task 1-7 (Draft Phase 1 Extended Summary Report)

Current scope assumes:

- Conducting a sixth and final community workshop to present preliminary, synthesized findings from the previous workshops along with draft findings from the supplemental research and state-of-the practice review; attendance by Ross Brindle, plus two Nexight staff, plus Jeremy Morris and Tom Ramsey (Geosyntec)

Additional scope items may be added as follows:

Scope Item	Additional Cost	Assumptions
Additional Attendance at Existing Workshop	$500	Abby Goldsmith attendance via WebEx or other online media
	$2,000	Abby Goldsmith in-person attendance ***Per response to previous Question 3***
Additional Workshop or Modification to Existing Workshop Format	Varies	See Task 1-4

Task 1-8 (Present Draft Phase 1 Report to County Executive and Council)

Current scope assumes:

- One 2-hour onsite meeting with PowerPoint presentation to the Steering Committee, with attendance by Jeremy Morris (Geosyntec) and Ross Brindle (Nexight); one 2-hour onsite meeting with PowerPoint presentation to the County Executive, with attendance by Jeremy Morris and Tom Ramsey (Geosyntec); one 2-hour onsite meeting with PowerPoint presentation to the County Council, with attendance by Jeremy Morris (Geosyntec)
- 30-day review cycle open to County residents with the draft report posted online on the County's website; two review cycles with the Steering Committee; one review cycle with the County Executive and County Council
- Steering Committee or County staff member will be appointed to track and consolidate comments from both County Executive and Council as well as public comments received during review cycles. Following Steering Committee consensus on the validity of comments, these comments will then be synthesized and provided to the Study Team for integration into the report.

Additional scope items may be added as follows:

Scope Item	Additional Cost	Assumptions
Additional Attendance at Meetings with Steering Committee, County Executive, or County Council	$500 per meeting	Abby Goldsmith attendance via WebEx or other online media
	$2,000 per meeting	Abby Goldsmith in-person attendance
	$500 per meeting	Tom Ramsey or Ross Brindle attendance
Capture and Summarize Public Comments Received Directly at Task 1-4 or Task 1-9 Workshops	$0	Included in scope for Tasks 1-5 and 1-8
Capture and Summarize Public Comments Received during Subsequent Review Cycles	$3,000	Geosyntec and Nexight will track and summarize public comments only; Steering Committee will summarize all comments from within the County ***Per response to previous Specific Questions 2 and 6 (which related to Task 2-5 but also relevant here)***

Task 2-2 (Four Season Waste Sort)

Current scope assumes:

- Develop scope of work for four-season waste sort

Additional scope items may be added as follows:

Scope Item	Additional Cost	Assumptions
Perform Targeted Four-Season Waste Sort	$35,000	Geosyntec will conduct tightly-scoped tailored waste sort for four 3-day events County will provide at no cost a rubber-tired backhoe or similar piece of equipment with operator County will provide at no cost roll-off boxes and equipment needed to weigh the sorted waste ***Per response to previous Question 2***
Perform Full Four-Season Waste Sort	$100,000	Geosyntec will conduct full four-season waste sort that meets general industry standards for statistical significance 30 waste samples per season for up to 30 targeted materials County will provide at no cost a rubber-tired backhoe or similar piece of equipment with operator County will provide at no cost roll-off boxes and equipment needed to weigh the sorted waste ***Per response to previous Question 2***

Task 2-3 (Financial Modeling and Detailed Analysis)

Current scope assumes:

- Six technologies reviewed in Task 1-6 will be reduced to three technologies or combination of technologies for financial modeling
- Financial modeling will include high-level cost inputs such as capital, financing, operations, taxes, and insurance as well as revenues for items such as tipping and user fees, sale of energy or materials, and tax or renewable energy credits
- The model will allow for changes in costs or revenues over time due to inflation
- Sensitivity analysis will be limited to "tipping-point" analysis of 2-3 key variables between different technologies

Additional scope items may be added as follows:

Scope Item	Additional Cost	Assumptions
Performed Detailed Multivariate Sensitivity Analyses	$15,000*	Sensitivity analysis will be limited to three technologies or combinations of technologies

* Note: Additional cost provided for indicative purposes only; should a detailed model be requested that involves the build-up of high-level inputs listed above or in the proposal from more than two or three variables, Geosyntec will provide a separate proposal with final costs depending upon the scope of services requested

Task 2-4 (Draft Phase 2 Report) and Task 2-5 (Phase 2 Presentation to County Executive and Council)

Current scope assumes:

- One 2-hour onsite meeting with PowerPoint presentation to the Steering Committee, with attendance by Jeremy Morris (Geosyntec); one 2-hour onsite meeting with PowerPoint presentation to the County Executive, with attendance by Jeremy Morris and Tom Ramsey (Geosyntec); one 2-hour onsite meeting with PowerPoint presentation to the County Council, with attendance by Jeremy Morris (Geosyntec)
- 45-day review cycle open to County residents with the draft report posted online on the County's website; two review cycles with the Steering Committee; one review cycle with the County Executive and County Council
- Steering Committee or County staff member will be appointed to track and consolidate comments from both County Executive and Council as well as public comments received during review cycles; Following Steering Committee consensus on the validity of comments, these comments will then be synthesized and provided to the Study Team for integration into the report

Additional scope items may be added as follows:

Scope Item	Additional Cost	Assumptions
Additional Attendance at Meetings with Steering Committee, County Executive, or County Council	$500 per meeting	Abby Goldsmith or Bill Gaffigan attendance via WebEx or other online media
	$2,000 per meeting	Abby Goldsmith or Bill Gaffigan in-person attendance
	$500 per meeting	Tom Ramsey attendance
Capture and Summarize Public Comments Received during Review Cycles	$3,000	Geosyntec will track and summarize public comments only; Steering Committee will summarize all comments from within the County ***Per response to previous Specific Questions 2 and 6***